Arab Republic of Egypt
Ministry of education
The Book Sector

Search and Learn

Science

For Primary Stage

Year 4

First Term

الأشـــراف برنتنج هاوس

2015 - 2016

غير مصرح بتداول هذا الكتاب
خارج وزارة التربية والتعليم

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مقدمة

عزيزى التلميذ/ التلميذة

يسعدنا ونحن نقدم هذا المنهج لأبنائنا تلاميذ الصف الرابع الابتدائى أن نؤكد على أن تعلم العلوم متعة وبهجة، متعة فى القيام ببعض الأنشطة العلمية البسيطة، وبهجة فيما يمكن الوصول إليه من نتائج. فتعلم العلوم يعتمد على الملاحظة والتفكير والتجربة واستخلاص النتائج. وقد تم اختيار عنوان لهذا المنهج يعكس فلسفته؛ وهو "ابحث وتعلم".

وقد شارك فى إعداد هذا المنهج مجموعة من المتخصصين فى المناهج وطرق تدريس العلوم والخبراء والموجهين والمعلمين. كما تمت فيه تجربة الاستعانة بمجموعة من تلاميذ المرحلة المستهدفة تأكيدًا لفلسفة المنهج من حيث مراعاة طبيعة المرحلة العمرية وطبيعة المعرفة والمجتمع.

ويهدف هذا الكتاب إلى مساعدة التلميذ على إدراك العلاقة بين العلم والتكنولوجيا ورؤية العلم من منظور شخصى ومجتمعى وفهم تاريخ وطبيعة العلم وتنمية مهارات التفكير العليا وامتلاك المفاهيم العلمية الأساسية. ولتحقيق هذه الأهداف تم استخدام أسلوب علمى تقدم فيه المفاهيم فى شكل وحدات دراسية فى ترابط منطقى مع بعضها بعضاً وتكامل مع المواد الدراسية الأخرى. كما أن الموضوعات المتضمنة فى هذا المنهج تتناول المفاهيم الرئيسية فى مجالات الكائنات الحية والمادة والطاقة والفلك مما يساعد على تشجيع البحث والاستقصاء العلمى.

ويتضمن الفصل الدراسى الأول وحدتين لكل منهما عنوان يدل على محتواها. فقد جاءت الوحدة الأولى بعنوان المادة والوحدة الثانية بعنوان الكون. وتشمل كل وحدة مجموعة دروس مترابطة ومتكاملة.

ويعتمد المنهج على إثارة رغبة التلاميذ والتلميذات فى المعرفة والتعلم، والاستفادة من الخبرات المحيطة بهم من كل جانب وذلك من خلال الاعتماد على الأنشطة والتدريبات المتنوعة. كما يعتمد المنهج على استراتيجيات التعلم النشط فى تنفيذ دروسه. ولذلك تم تزويد الدروس بمصادر المعرفة ووسائل التكنولوجيا الحديثة بما يشجع مهارات البحث والتعلم الذاتى وتنمية مهارات التفكير الناقد ومساعدة التلميذ على التأمل والتقييم الذاتى فيما يدرسه ويتعلمه، بما يتفق وفلسفة التقويم الشامل.

ونحن إذ نقدم هذا الكتاب نرجوا الله أن يحقق الفائدة منه.

والله ولى التوفيق

المؤلفون

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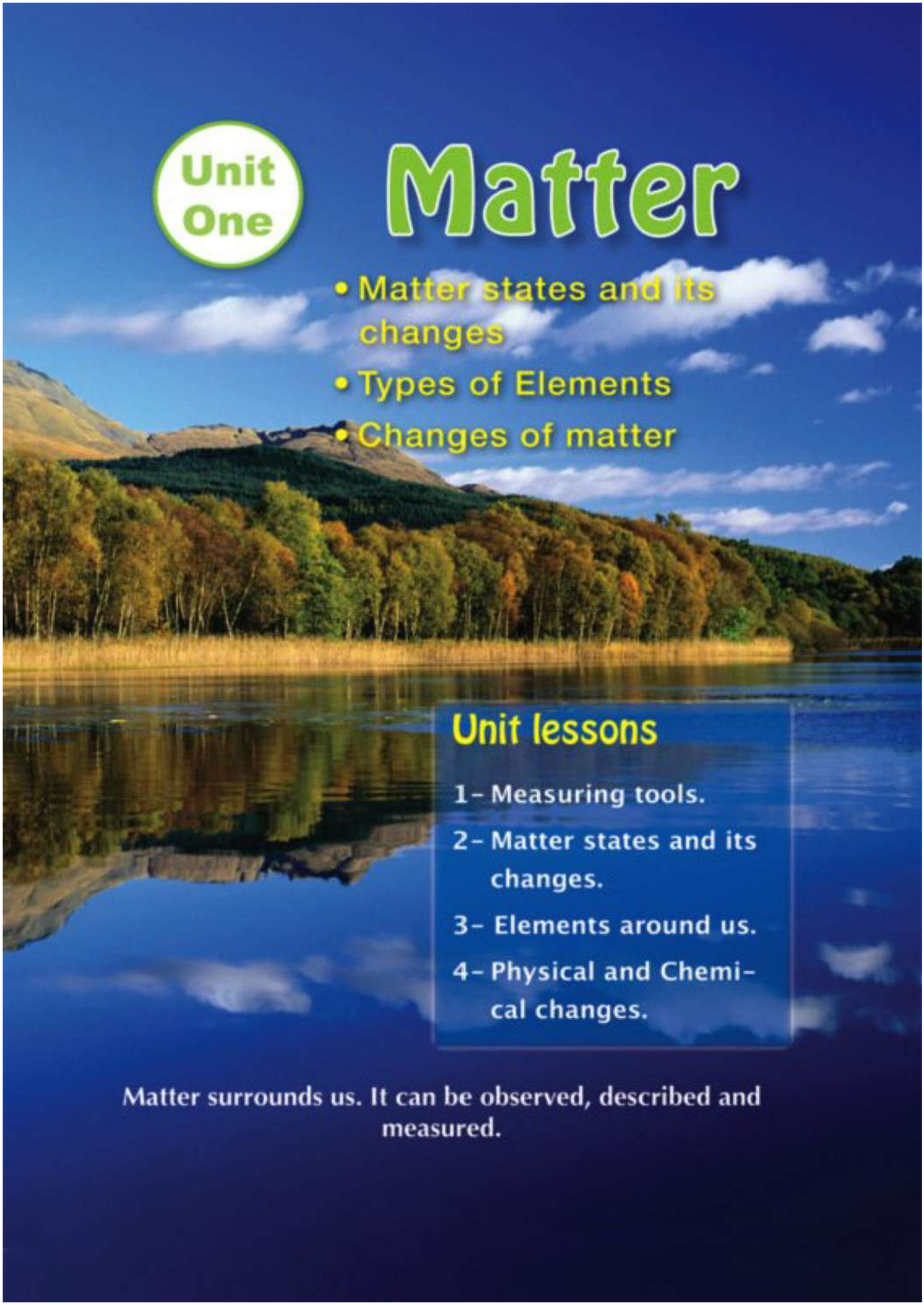

Unit One
Matter
• Matter states and its changes
• Types of Elements
• Changes of matter
Unit lessons
1- Measuring tools.
2- Matter states and its changes.
3- Elements around us.
4- Physical and Chemical changes.
Matter surrounds us. It can be observed, described and measured.

Objectives

By the end of this unit, a student will be able to:

1. Use the length and mass measuring tools.
2. Calculate the volume of solid objects.
3. Conclude that the equal volumes of different materials have different masses.
4. Examine the shape of a set of solid materials.
5. Perform activities to conclude the properties of metals and nonmetals.
6. Classify the materials into metals and nonmetals.
7. Compare metals to non-metals.
8. Record his daily observations on some of the changes occurred in the matter.
9. Participate his classmates in performing the activities of the unit.

1 LESSON ONE

Measuring Tools

Lesson Objectives

By the end of the lesson, a student will be able to:

1. Recognize the length and mass measuring tools.
2. Name the length and mass measuring units .
3. Measure the length of different objects.
4. Find the mass of different quantities of matter.
5. Calculate the volume of regular shape solid object.
6. Find the volume of an irregular shaped solid object that does not dissolve in water.
7. Prove by an activity that equal volumes of different materials have different masses.
8. Highlight the importance of measuring tools in our life.

Lesson Items

- Length and Mass
- Volumes of solid objects.
- Masses of different matter volume.

Life Issues

- Rationalizing consumption.

Measuring Tools

We are surrounded with a countless number of things different in shape, size and mass. All these things are known as "Matter". As you know that matter is "every thing that has a mass and occupies a space".

When you buy some of these things such as cloth, the vendor measures the length, when you buy vegetables, fruits or meat, he estimates the mass and when you buy a quantity of oil, you ask for a volume of a litre more or less

Mass: Is the amount of matter in an object.

Volume: Is the space occupied by a matter.

Activity (1): Measuring Tools

Here are, some photographs for measuring tools of lengths, masses and volumes, try to identify them then complete the following table:

Sensitive balance

Common balance

Graduated tape

Measuring ruler

(Graduated cylinder)

Quantity / Measuring tool	length	Mass	Volume
1- Common balance (two pans)		✓	
2-			
3-			
4-			
5-			

We use:

1- Graduated tape and measuring ruler in measuring lengths.

2- Common balance and sensitive balance in measuring masses.

3- Graduated cylinder in measuring volumes.

Measuring Units

There are large and small measuring units, for example, when estimating the dimensions of the classroom, we use "metre" while in estimating the length of a pencil, we use "Centimeter". But when you buy fruits, we use " kilogram " or a part of it while using "Gram" or a part of it in estimating the mass of gold. to learn more, try to perform this activity.

Activity (2): Objects and measuring units:

Here are a set of objects, identify the best units for measuring length and mass in the following table:

	the object	unit of measuring the length	unit of measuring the mass
1-	Table		
2-	Pencil		
3-	Sciece book		

- **Length measuring units are: meter - centimeter.**
- **1 meter = 100 centimeter.**
- **Mass measuring units are: Gram - Kilogram.**
- **1 kilogram = 1000 gram.**

Exercise:

What is the benefit of measuring tools when purchasing some things according to your point of view?

.....

.....

Read and learn

There are large units for measuring length and mass:

Kilometer = 1000 meter

Ton = 1000 kilogram

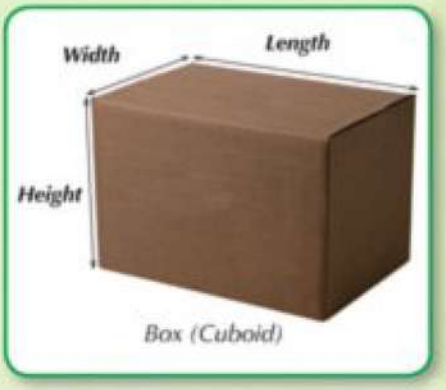
Estimating volumes of solid objects:

Solid objects may be regular or irregular in shape.

Activity (3):Calculating the volume of a regular shaped solid object

On calculating the volume of solid objects like a regular box or cardboard, we measure the value of length, width and height. The product of multiplying these values equals the volume of space occupied by the box or the cardboard.

With your classmates, use the measuring ruler to measure the dimensions of this box, then calculate its volume.



Box (Cuboid)

Length = ... centimeter

Width = ... centimeter

Height = ... centimeter

Volume of cuboid = height × Width × Length

Volume of the box = ... Cm^3

Activity (4): Estimating Volumes of irregular shaped solid objects

Have a graduated Cylinder containing a quantity of water.

Record the reading of the level of water in the cylinder, then gently place a small piece of marble into the cylinder and continue adding a number of marble pieces then record the level of water in the cylinder each time you place a marble piece in the following table.

What do you observe?

.....

Conclusion: .....

.....

Number of marble pieces	Reading of the measuring cylinder
None	.....Cm^3
1	.....Cm^3
2	.....Cm^3
3	.....Cm^3

If an object is submerged in a measuring cylinder containing water, water raises up with a volume equals the volume of the object

- **Liquid volumes measuring unit is: liter or milliliter**
  Liter = 1000 milliliter or = 1000cm^3
- **Solid volumes measuring unit is the Cubic meter (m^3) or the cubic centimeter (cm^3).**

Attention!

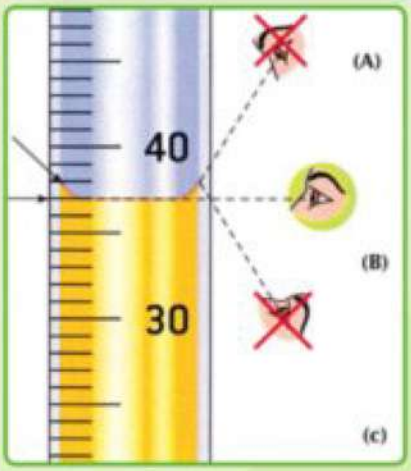
on reading the measuring cylinder, the vision must be in a horizontal position at the bottom point of water level.

Exercise:

- The correct reading of water volume in the following measuring cylinder is ($38cm^3$ - $36cm^3$- $37cm^3$)
- To determine the correct reading to the water volume in the measuring cylinder you have to take the position:
  (A - B - C).

Read and learn

You can use oil instead of water in measuring the volume of a solid that is dissolved in water



Activity (5): How to estimate the volume of a stone?

In our daily life, we face some problems, we have to follow certain ways of thinking and Procedures to solve a problem, therefore it is necessary to define the problem and the suggested alternatives for a problem solving, then check reasonability of these alternatives to reach a proper replacement for solution.

Suppose that your teacher asked you to determine the volume of the following stone, so that:

The problem you face is: .....

Problem solving suggested alternatives are

1- ..... 2- .....

Alternative suitability examination:

1- ..... 2- .....

The Suitable alternative is: .....

The following is one of your classmates alternative solution:

The problem: How do we determine the volume of the stone while it is an irregular shaped object?

Problem solving suggested alternatives are:

1- Measure the dimensions of the stone.
2- Place it to a measuring graduated cylinder containing water then calculate the increase in the reading of that measuring graduated cylinder.

Alternative suitability examination:

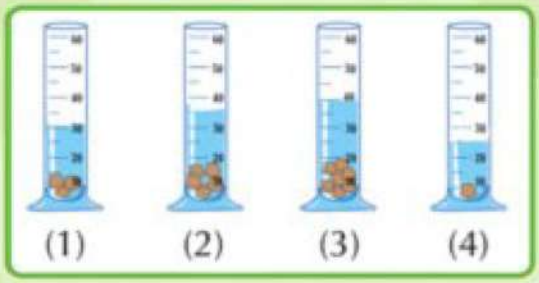
1- The first alternative is not correct because the stone has an irregular shape.
2- The second alternative is suitable because the stone has an irregular shape and does not dissolve in water.

The suitable alternative is: The second alternative.

How do you see your classmates problem solving strategy?

.....

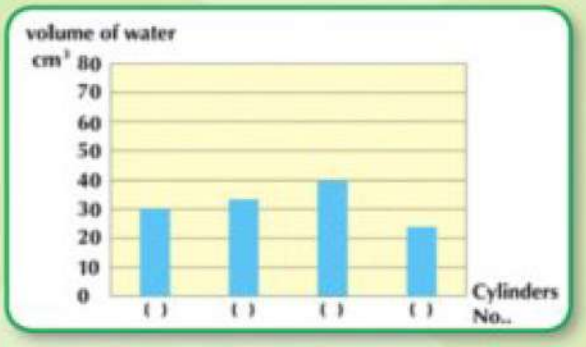
Exercise:



Have four similar graduated cylinders containing the same amount of water. Place a different number of iron pieces that are equal in volume to each cylinder as shown in the figure:

The reading of water volume in each cylinder is recorded and represented graphically as follows:.

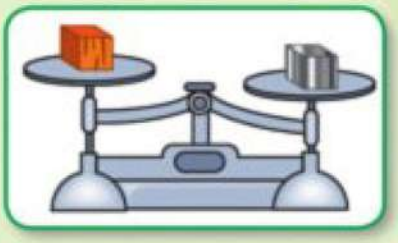
Put the number of the suitable cylinder under each column of the four graphical columns



Activity (6): Masses of equal volumes to different materials

Here are some cubes of equal volumes made up of iron and wood.

Put an iron cube on a pan of a common balance then place a wooden cube on the other one.



What do you observe? .....

Repeat the previous step by using two iron cubes on one pan and two wooden cubes on the other.

What do you observe? .....

Conclusion: .....

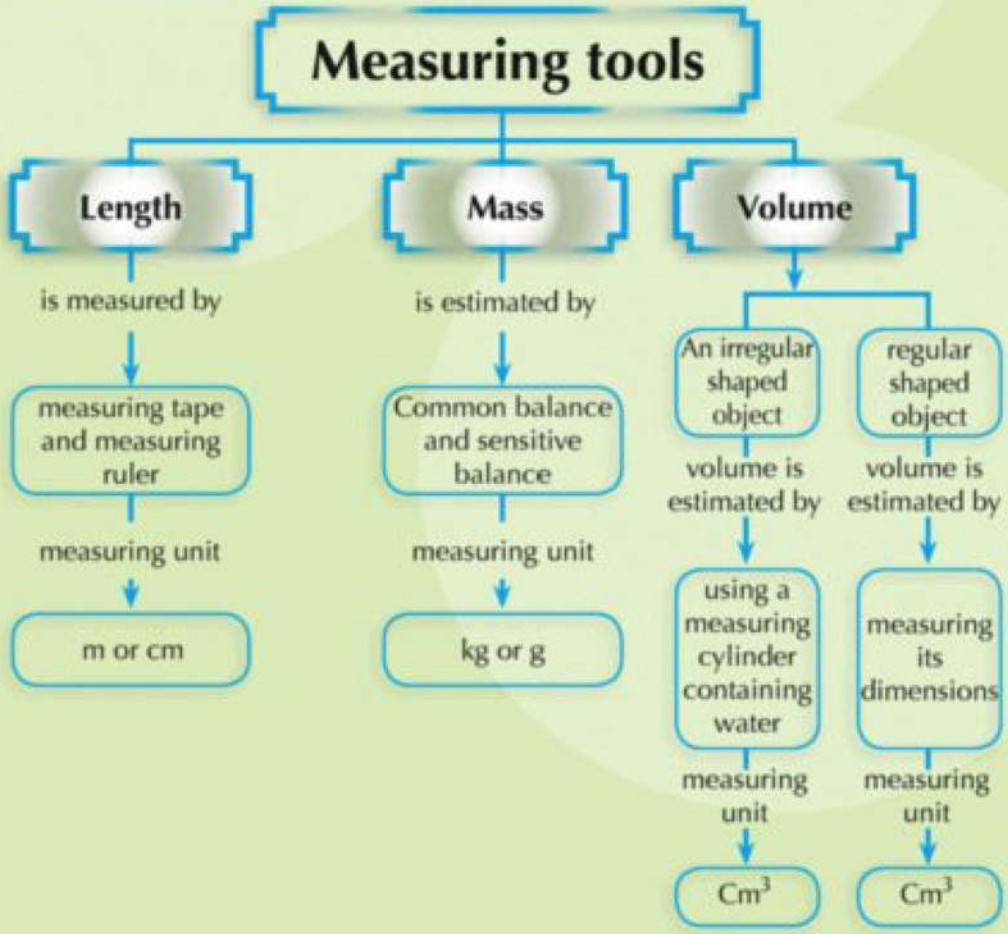
- **Equal volumes of different materials have different masses.**

Optional activities

Choose one of the following activities and perform it.

- Prepare an album for modern and old different measuring tools.
- Write short notes about the importance of measuring tools in our life.

Summary



Exercises and activities

Question (1): Complete the following Sentences

1-A matter has ..... , ...

2- Kilogram is the unit of measuring ..... .

3- Meter is the unit of measuring ..... .

4- Measuring tape is used for measuring ..... .

5- Common balance is used for measuring ..... .

6- Measuring ruler is used for measuring ..... .

7- Amr has calculated the mass of four equal pieces in volume but from different materials and compared between the mass of each one, so that Amr wants to prove that the mass of equal volumes of different materials are ..... .

Question (2) Choose the correct answer:

1- A stone is put in a jar containing $30cm^3$ of water, water level raises in the jar up to 50 cm^3, so that the volume of the stone equals .....

A- 20 cm^3 **B-** 30 cm^3 **C-** $50cm^3$ **D-** $80cm^3$

2- Your Classmate placed a piece of iron into a $50cm^3$ beaker filled completely by water, so that a quantity of water of volume $20cm^3$ is poured out the beaker. The volume of this piece equals .....

A- 20 cm^3 **B-** 30 cm^3 **C-** $50cm^3$ **D-** $70cm^3$

3- The volume of a solid material is measured by : .....

A- cm **B-** cm^2 **C-** cm^3 **D-** meter

4- We can determine the volume of irregular shaped small stone that does not dissolve in water by using .....

A- a glass beaker **B-** a measuring cylinder

C- a common balance **D-** a graduated ruler

5- A pupil placed four marbles of equal volume in a 100cm^3 graduated cylinder containing water. The water level raised up to 120 cm^3, what is the volume of each marble?

A- 30 cm^3 **B-** 25 cm^3 **C-** 20cm^3 **D-** 5cm^3

Question (3) One of your classmates determines the mass of three pieces equal in volume then he found that they are equal in mass. Are these three pieces made up of the same material or from a different one ? why?

Question (4) you have a measuring cylinder and water - how can you use these materials to estimate the volume of a medal?

Self reflection and self evaluation

Dear student, after you've Studied measuring tools, fill in the following card:

(A) What are the items you like in the lesson?

.....

(B) What are the items you dislike in the lesson?

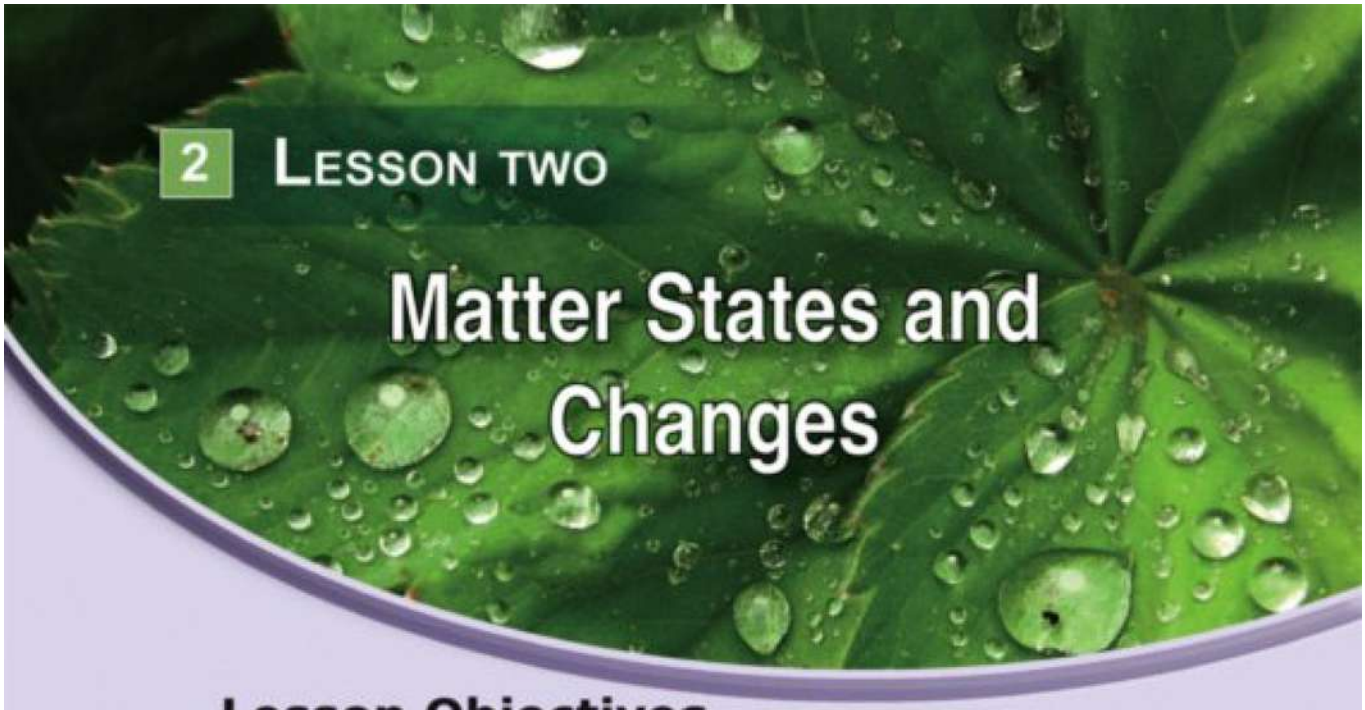
.....

(C) What is the best comment you have received Concerning your performance to the activities of measuring tools?

.....

(D) What are the problems that you faced while carrying out the activities of this lesson? and how could you overcome them?

.....



2 LESSON TWO

Matter States and Changes

Lesson Objectives

By the end of the lesson, a student will be able to:

1. State the three states of matter.
2. Determine the properties of the different states of matter.
3. Classify different materials according to their states.
4. Conclude the similarities and differences between the states of matter.
5. Identify the ways of changing the matter from one state to another .
6. Conclude the temperature change effect on the states of matter.
7. Compare among melting, evaporation, condensation and freezing

Lesson Items

- The three states of matter
- Properties of matter.
- Matter changes

Life Issues

- Resources best usage and development.

A plenty of materials are surrounding us such as iron, water and air, they differ from each other in many properties. A matter is found in one state or more and can be changed as the change of ice into water and the change of water into water vapor, each state has its physical properties that are different from other states.

Activity (1): Identifying states of matter

Look at the materials in the shown pictures then classify them into three groups according to their properties, in the following table:

Pot with water *Glass of water* *Air balloon*

A bottle of oil *Pen* *Ruler*

Group (1)	Group (2)	Group (3)
Pen	Water	Air Balloon

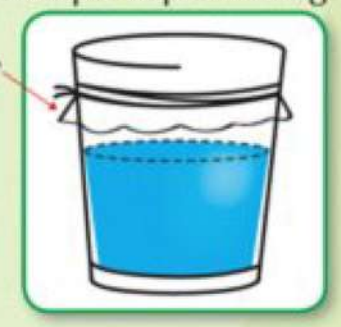
What is the common property for the materials in each group?

.....

There are three states of matter: Solid, liquid and gas

Exercise:

Look at this picture then try to give an example representing the matter states.

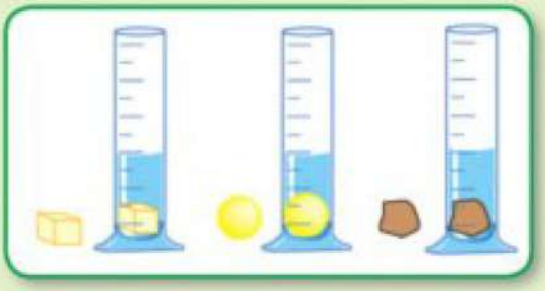


- ..... State is represented by .....
- ..... State is represented by .....
- ..... State is represented by .....

Properties of the three states of matter:

Activity (2): Solids shape and volume

Place each object from the following shown objects into a jar.



Compare between the volume of each object in the jar and its real volume.

Compare between the shape of each object in the jar and its real shape.

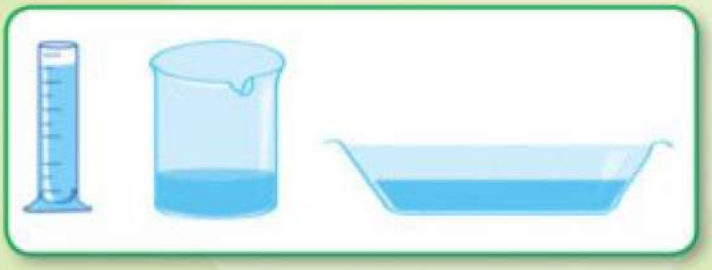
What do you observe? .....

Conclusion: .....

Solids have definite shape and definite volume

Activity (3): Liquids shape and volume

Place 100 cm^3 of water in each of the following shown pots:



1- Does the volume of water change in the three pots? .....

2- Does the shape of water change in the three pots? .....

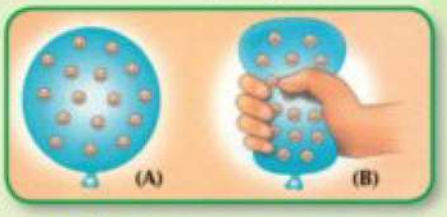
Repeat with other pots .....

Conclusion: .....

Liquids have definite volume but its shape changes according to the container.

Activity (4): The shape and volume of gaseous materials

Blow a balloon, tie it with a thread as Shown in figure (A) then press upon it by your hand as shown in figure (B) and observe the following:



- Is the balloon volume changed ?
  .....
- Is the balloon shape changed?
  .....
- Repeat with other balloons

Conclusion: .....

Gases: their shapes and volumes are changing according to the container.

Read and learn

From the practical applications of gas that the shape and volume of gases can be changed. We can press a large quantity of gas inside gas cylinders and oxygen cylinders.

Changes of Matter

You have learned that matter has more than one state and it can be changed from one state to another.

Activity (5): Melting

Have a plastic cup containing some pieces of ice then leave it outside the refrigerator for a period of time

What do you observe?.....

Conclusion: .....

Melting: It is the change in a matter state from solids to liquids by heating

Activity (6): Evaporation

During preparation of tea, write your observations about the state of water in the pot when heating.

What do you observe?.....

Conclusion: .....

The amount of water keeps decreased as long as you are heating because it changes into vapour.

Evaporation: It is the change of matter from liquid to gas by heating

Activity (7): Condensation

On your way to school early in the morning, you notice the presence of drops of water on leaves or on cars.

Have you ever asked yourself the reason for the presence of these drops? .....

Why can it be only observed in the morning?.....

Conclusion: water vapour is assembled in the air condensing on the cold surfaces like cars and leaves in winter, or when humidity temperature is rised in summer then condensed into drops of water due to the decreased temperature.

Condensation: It is the change of matter from the gaseous state into the liquid state when cooling

Activity (8): Freezing

When a bottle containing a quantity of water left out of the freezer for one day, observe the change in the water state after and before placing the bottle in the freezer.

Conclusion: .....

Water is changed into ice in the bottle when cooling.

Freezing: It is the change of a matter from liquid into solid by cooling.

Attention!

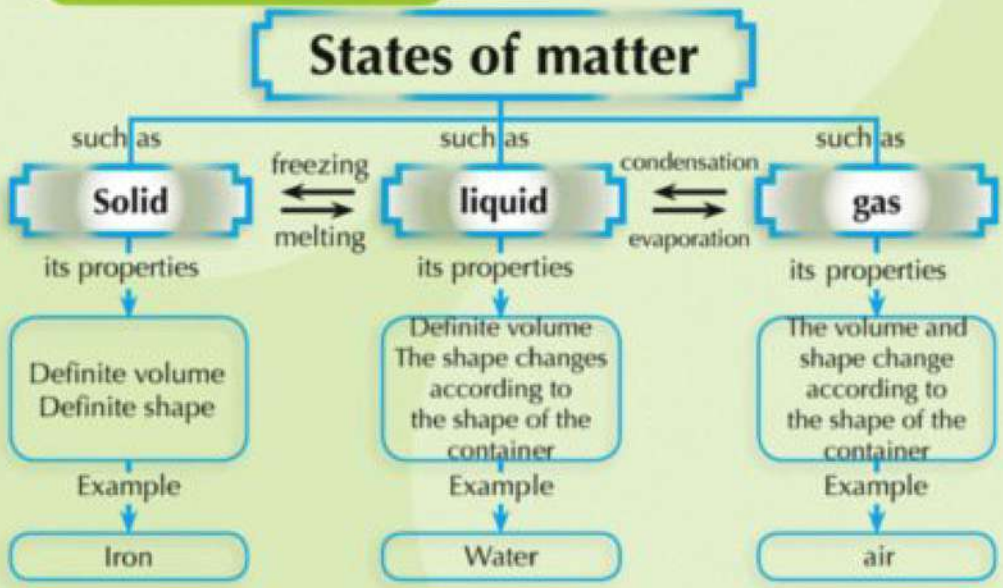
It is preferred not to fill a bottle of water to an end when it is put in the freezer in order not to explode

Optional Activities

Choose one of the following activities then carry it out.

- Make an album for photos of solid, liquid and gaseous materials in your environment then mention their uses.
- Imagine that you are a solid material such as iron ore. What would you say to your classmates representing liquid and gaseous materials?
- Try to use the internet to search for pictures indicating the changes of matter and write a simple description to them .
- Write about some life applications that depend on changes of matter.

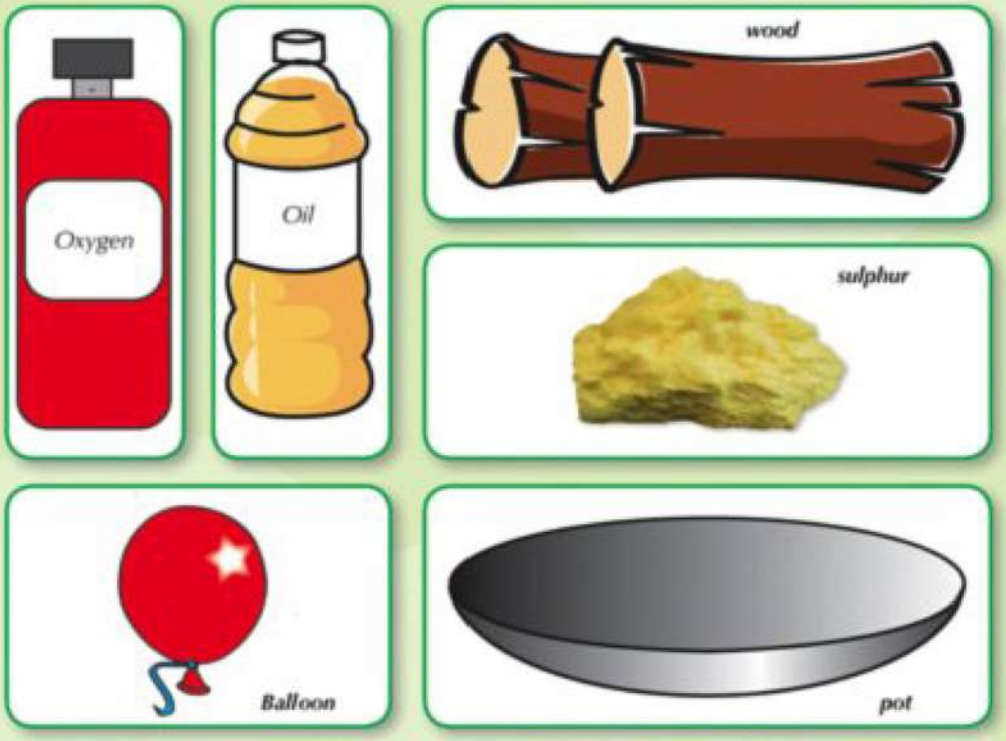
Summary



- Melting: it is the change of matter from a solid into a liquid state by heating
- Condensation: it is the change of matter from a gaseous state into a liquid by cooling.
- Freezing: it is the change of matter from a liquid state into a Solid one by Cooling
- Evaporation: it is the change of matter from a liquid state into a gaseous one by heating

Exercies and activities

Question (1): Put (✓) to the materials that have a definite shape:



Question (2): Complete the following statements:

1- States of matter are ....., ... and ..... .

2- There are a definite shape and a definite volume in the ..... state.

3- Matter can be pressed in case of its ..... state

4- Matter that takes the shape of its container and its volume can not be changed is .....

5- On transferring water from one pot to another, it .....

.....

Question (3): Give a reason: On putting a mixture of gravels and water in a refinery with minute holes, water passes while gravels remain in the refinery.

Question (4): Choose from the column (b) that is suitable for column (a)

(A)	(b)
• The change of matter from the liquid state into the gaseous state • The change of matter from the solid state into the liquid state • The change of matter from the liquid state into the Solid state • The change of matter from the gaseous state into the liquid state.	1. Melting 2. Freezing 3.Condensation 4. Evaporation

Question (5) Choose the correct answer:

1- The change of water from the liquid state into ice is accompanied with:

A- an increase in mass **B-** an evaporation

C- an increase in temperature **D-** a decrease in temperature

2- The change of matter from the liquid state into the gaseous state is called:

A- Condensation **B-** evaporation

C- Melting **D-** Freezing

3- Cooling is accompanied with ..... process

A- Melting **B-** Condensation

C- evaporation **D-** (a) and (b) together

4- Gold industries need ..... process

A- Melting then cooling . **B-** Condensation then cooling .

C- evaporation then cooling . **D-** Cooling then melting .

Self reflection and self evaluation

Dear student, after you've finished studying the states of matter and their changes, fill in the following card

(A) What are the items you like in the lesson?

.....

(B) What are the items you dislike in the lesson?

.....

(C) What is the beautiful comment you have received Concerning your performance to the activities of measuring tools?

.....

(D) What are the problems that you face while carrying out the activities of this lesson? and how you overcome them?

.....

3 LESSON THREE

Elements around us

Lesson Objectives

By the end of the lesson, a student will be able to:

1. Examine the shape of a group of substances.
2. Conclude the properties of elements .
3. Perform an activity to show the characteristics of the elements.
4. Design an activity classifying elements into metals and non-metals.
5. Determine the uses of metals and nonmetals according to their properties.
6. Conclude the properties of metals and nonmetals.
7. Identify the metal and non-metal through their characteristics.
8. Join with his classmates to search for more information about metals and nonmetals.
9. Compare between metals and nonmetals.

Lesson Items

- The apparent shape of elements
- Classification of elements.
- The economical importance of elements

Life Issues

- Developing the environmental resources

In our daily life we use cooking pots, metal cans for food and juices, also we use cars that move over the bridges also we use electric wires and other various materials.

Let us know these materials

Activity (1): Meterial Components

In the following picture, a group of solid objects. Try to identify their apparent shape then fill in the following table:

No	The Solid object	Its meterial
1	A nail	
2	A spoon	
3	An electric wire	
4	A piece of coal	
5	A piece of sulphur	

The objects identified in this activity are consisted of materials known as elements

Read and learn

- The number of elements found in nature is 92 and this number reached 118 after the synthesis of a number of elements
- The element is consists of smaller particles known as molecules and molecules are consists of atoms
- An element contains one type of atoms which are different from the atoms of other elements.

The Element: is the simplest form of matter that can not be decomposed into two substances or more.

The use of the previous elements in order to manufacture different products depending on studying the properties of these elements

Nails

Activity (2): Elements and lustre:

Materials differ from each other in lustre, Here are some tools to identify them.

A copper lock

■ Materials

- A shiny iron nail
- A copper lock
- An aluminium spoon
- A piece of coal

■ The Procedures

Examine the following elements and classify them according to their lustre then fill in the following table:

No	The object	The element	has lustre	has not lustre
1	Nails	Iron	✓	
2	Lock	copper		
3	Spoon	Aluminium		
4	Coal	Carbon		

Conclusion: .....

Some elements have lustre such as iron, copper and aluminium where as some don't such as sulphur and carbon.

Exercise:

Name two elements that have lustre and you use them in your life.

Activity (3): Elements and electrical conductivity:

Electrical conductivity is one of the important properties of elements and a lot of industries depend on this property .

Perform the following activity to identify the conductors and insulators elements for electricity.

■ Materials:

Electric wires - a battery - a small lamp - different objects such as (a fork - aluminium paper - a coin - a pencil - a sulphur column)

■ Procedures

Set up an electric circuit as shown in the figure.

A Pencil is replaced with one of the previous objects, and notice the light of the lamp.

Have your classmates in the group use other objects and observe the light of the lamp in each case.

Record your observations in the following table:

No	Object	element	the lamp will light	the lamp not light
1	Tip of Pencil	Carbon (graphite)		
2	Fork	Iron		
3	Coin	Copper		
4	Foil paper	Aluminium		
5	Sulphur column	Sulphur		

What do you observe? .....

Conclusion: .....

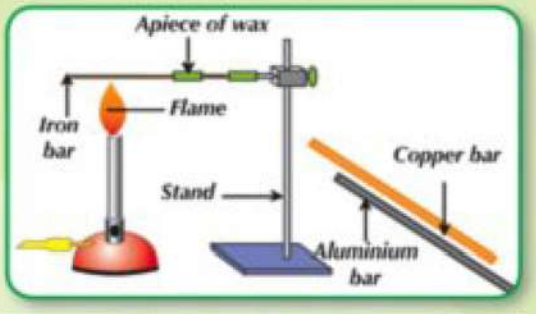
The Tip of the pencil is made up of graphite and it is a form of carbon.

Some elements are good conductors of electricity and others are bad conductors of electricity

Exercise: Write using one of the sources of knowledge such as (CDs - Internet - Books) about the elements that can be used in manufacturing electric wires and their importance.

Activity (4): Elements and heat conductivity:

- **Materials:** Bars of (iron -copper - aluminium) - stand - a flame- apiece of wax.
- **Procedures:** you have a group of elements, replace each of them in stead of the iron bar in the opposite figure.



Ask your classmate to record the time taken for melting the piece of wax in case of each element, then fill in the following table :

No	element	time
1	Iron	
2	Aluminium	
3	Copper	

What do you observe? .....

Conclusion .....

Attention!
Don't try to touch the bar with your hand.

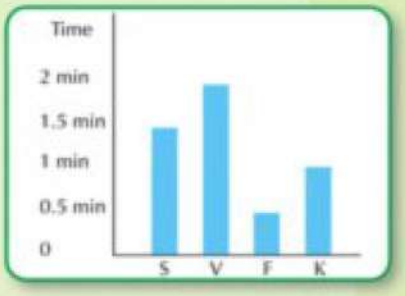
Explaination: Elements of iron, copper and aluminium conduct heat by different degrees, but there are other elements that are bad conductors heat such as sulphur and carbon.

Some elements are good conductors of heat where as some of them are bad conductors to it.

Exercise: The time of wax melting is recorded for each of the following elements (S, V, F, K) then is graphically represented as shown in the figure.

Arrange the elements (S, V, F, K) in ascending order according to their heat conductivity.

Arrangement	element
The first	.....
The second	.....
The third	.....
The fourth	.....

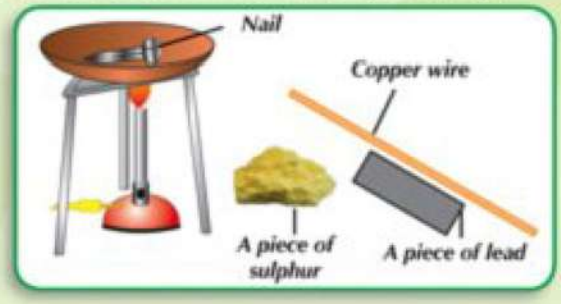


Activity (5): Elements and melting

You have studied that melting is the change of matter from the solid state to the liquid state and it is on of the important properties of elements, for studying that, Perform the following activity:

■ **Materials:**

A flame - a stand for the flame - a crucible - an iron nail - a piece of sulphur - a piece of lead- a copper wire.



■ **Procedures:** - Put the iron nail in the crucible. - put the crucible on the flame. - Have your classmates in the group heat the other elements.

What do you observe? .....

Conclusion : .....

Elements differ in their melting points.

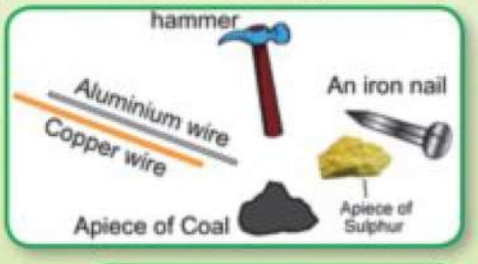
Exercise: By using wikipedia website "Free Encyclopedia", write a list of a group of elements and their melting points.

Activity (6): Elements and Malleability

We use aluminium foil in cooking and packaging food and we see the iron smith forming the doors and windows from iron and we see the jewells that are made up of gold and silver. How are these things made? to know the answer, perform the following activity:

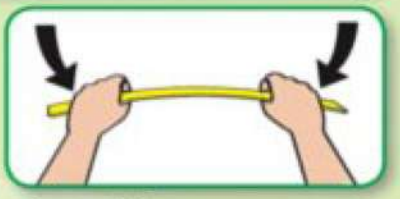
■ Materials:

An iron nail - a copper wire - An aluminium wire - a piece of coal - a piece of sulphur- a hammer



■ Procedures:

Cooperate with your classmates in bending and hammering the elements existing in front of you.



Record your observation in the following table:

Elements that are malleable and ductile	Elements that are not malleable or ductile
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

Read and learn

- Gold is a flexible element so that copper is added to it in order to reshape it into jewelry and it can be added to silver and platinum as well.
- Silvery paper which is used in covering chocolate shows that aluminium can be hammered and bent.

Conclusion .....

Some elements are malleable and ductile where as some are not malleable or even ductile.

Activity (7): Classification of elements

According to your studying for the properties of elements, describe the common characteristics of elements in each group in the two figures (a) and (b). Then record them in the following table.

Group (a)	Its properties	Group (b)	Its properties
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

What do you observe? .....

Conclusion .....

Elements can be classified into two groups:

1- A group of metals such as iron, copper and aluminium, and they have the following properties:

- Have luster
- Good conductors heat
- Good conductors electricity
- Malleable and ductile
- High melting point

2- A group of non -metals such as sulphur and carbon, and they have the following properties:

- Not having luster
- Bad conductors heat
- Bad conductor electricity except "carbon"
- Not malleable or ductile
- Low melting point

Metals: **Solid elements in ordinary temperature except (mercury which is a liquid) have high melting and boiling points. have the ability to conduct electricity, can be hammered, pulled and bent, have a lustre (if they are pure).**

Non-metals: **Elements that have low melting and boiling points- bad conductors electricity (except carbon)- can't by hammered, pulled or bent- have not lustre. For example, solid elements such as (carbon, suluphur and phosphorus), a liquid element (Bromine) and most of them are gases.**

Exercise: Classify the following elements into metals and non metals.

Uses of metals and non-metals

Scientists studied the properties of elements to use them in different life applications for a better life

Activity (8): Life applications for elements

Here are some elements and their life applications. You are asked to determine the property that the application depended on.

Read and learn

- Ancient Egyptians used gold, silver and copper since 3000 B.C.
- Some metals have magnetic properties such as iron, cobalt and nickel.
- Aluminium is a good Conductor of electricity so, cables of electricity are made up of it
- All metals are solids except mercury which is a liquid and used in thermometers manufacture.

Element	The important applications	properties
Copper	electric wires	.....
Iron	Bridges	.....
Gold	Jewelry	.....
Aluminium	Cooking pots	.....
Graphite (carbon)	Poles of carbon in electric cells	....

From the previous, we conclude that there are many uses for metals and non-metals such as:

1. Iron is used in manufacturing cars frames, bridges, doors and lamp-posts.
2. Aluminium is used in manufacturing cooking pots and foil paper .
3. Copper is used in manufacturing statues, coins and electric wires.
4. Gold is used in manufacturing jewels.
5. Carbon (graphite) is used in manufacturing positive poles of dry cells (batteries).

Read and learn

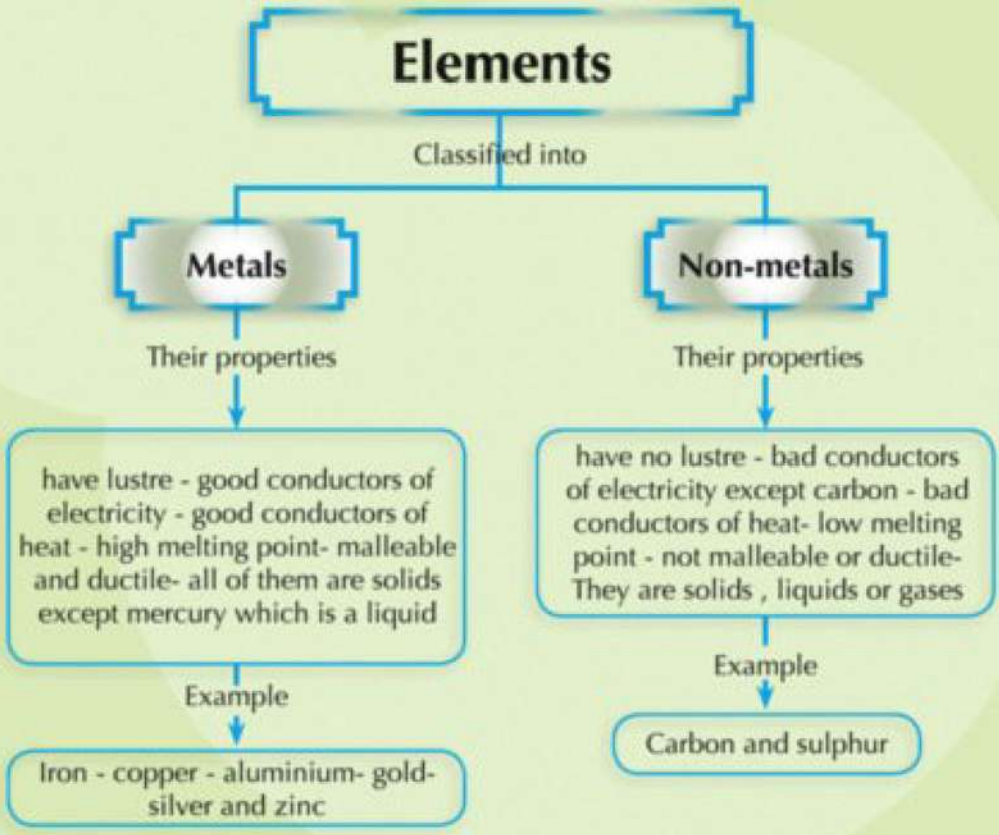
- From our arabic scientists "Jaber Ibn Hyan" who was the first one entered he experimental researches to chemistry and discovered acids and alkalis.
- From the foreign scientists "Brothelios" who was discovered rubber tubes and tools of laboratory.

Optional activities

Choose one of the following activities then Perform it :

1. Make an album of photos showing the uses of metals and non-metals with sharing of your classmates.
2. Share your classmates and teacher in visiting one of factories that depends on metals or non-metals manufacturing and write a report of this visit.
3. Write a brief on one of the elements using (transparents - video -CDs - Internet- books or encyclopedias)

Summary



Exercises and activities

Question (1): Complete the following sentences by these words metals - Iron- elements - Non-metals - gold - carbon.

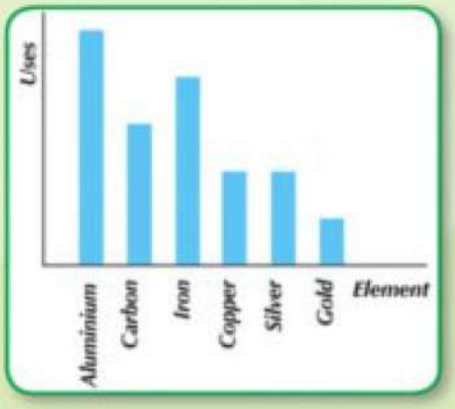
1- We use ..... in manufacturing jewels .
2- We use ..... in manufacturing bridges.
3- Poles of electric cells are made up of .....
4- All the materials you see in your environment are made up of .....
5- The group of elements that have lustre is known as .....
6- The group of elements that doesn't have lustre is known as .....

Question (2): Choose the correct answer from the following:

1- Electric wires are made up of .....
A- sulphur B- Carbon C- Copper
2- Cooking pots are made of .....
A- aluminium B- Iron C- sulphur
3- Gold and silver are used in manufacturing .....
A- Bridges B- planes C- jewels
4- Statues are made up of .....
A- Copper B- Sulphur C- Carbon

Question (3):

One of the researchers has been studying the market and monitoring consumption rates and elements usage in the specified period. They have been placed in a graph. Study the graph and determine the most and least element used, then select the uses of each element.



Question (4): Write the scientific term:

1- It is the simplest form of matter that can not be decomposed into two substances or more.

2- A group of elements having lustre - good conductors of electricity and heat- high melting point - malleable and ductile- all of them are solids except mercury which is a liquid.

3- A group of elements that doesn't have luster- bad conductors of heat and electricity except carbon - low melting point- not malleable and ductile.

Self reflection and self evaluation

Dear student, after studying the lesson of elements around us, fill in the following card:

(A) What are the items you like in the lesson?

.....

(B) What are the items you dislike in the lesson?

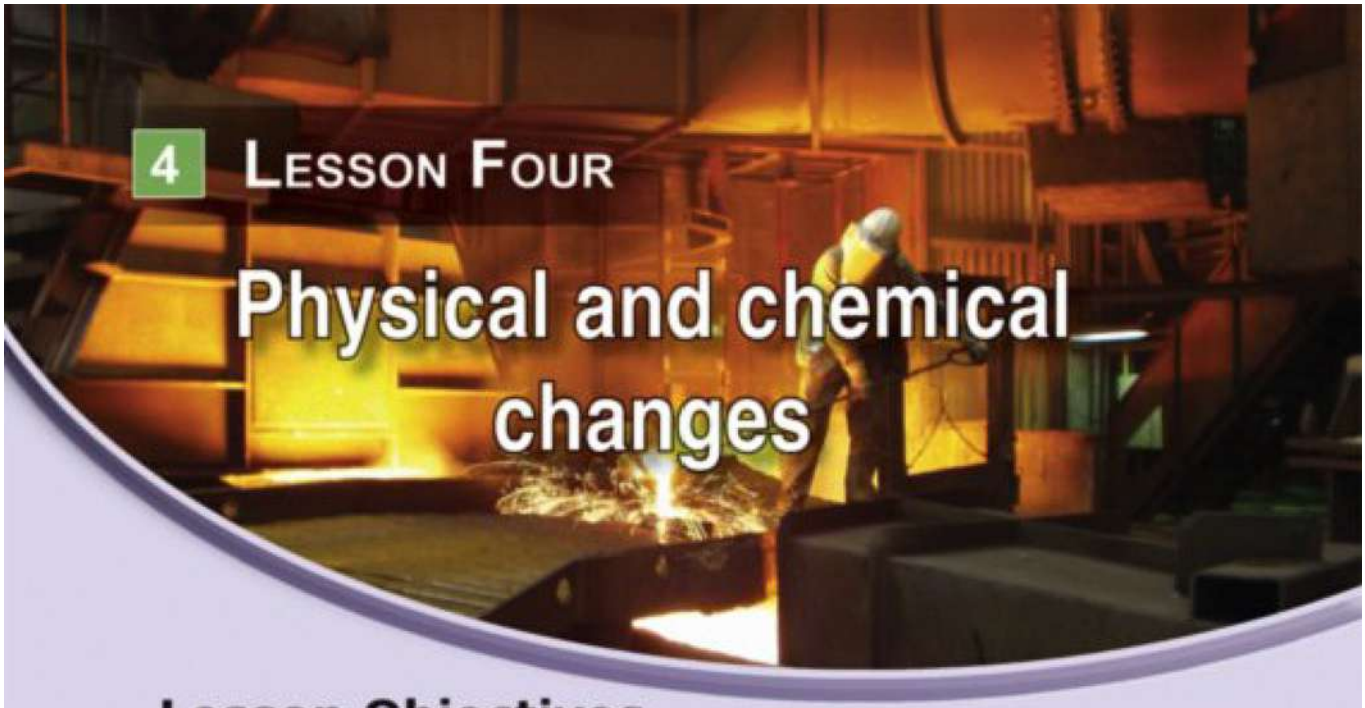
.....

(C) What is the best activity you have performed with your group in the lesson of elements around us?

.....

(D) What are the problems that your group face while carrying out the activities of this lesson? and how could your group overcome them?

.....



4 LESSON FOUR

Physical and chemical changes

Lesson Objectives

By the end of the lesson, a student will be able to:

1. Determine the physical changes of matter in our daily life.
2. Prove by an experiment the chemical changes of matter.
3. Explain the concept of physical changes and chemical changes.
4. Give examples for the different changes in the environment.
5. Compare between the physical change and the chemical changes of matter.

Lesson Items

- Physical changes of matter
- Chemical changes of matter

Life Issues

- Good resources usages and development.

From our daily observation, we find that there are changes in the matter such as its changes from one state to another and this is known as "physical changes", there are other changes affecting the matter are known as "chemical changes", to identify these changes try to perform the following activities:

First: Physical changes

Activity (1): Ice cycle

- **Materials:** a glass beaker - a glass surface - a flame- a stand - pieces of ice.
- **Procedures:** - Put the pieces of ice in the beaker then put the beaker over the flame as shown in figure (A).

What do you observe? .....

- Continue heating as shown in figure (B).

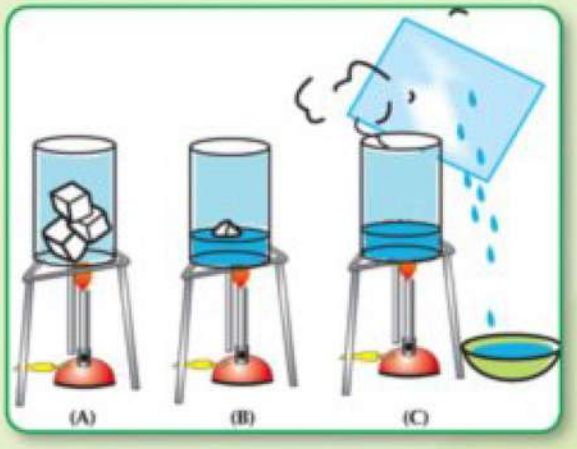
What do you observe?

.....

- Put the cold glass surface facing the produced water vapour as shown in figure (C)

What do you observe?

.....



- Put the assembled substance in the other beaker (figure C) in a freezer for a period of time.

What do you observe? .....

Conclusion .....

Ice changes into water by heating (melting) and by continuous heating water boils and water vapour is released then condenses on the cold surface to form water drops (condensation) that freezes by putting it in freezer (Freezing) to return back to its primary state which is ice.

Activity (2): Melting of wax

- **Materials:** a glass watch - a match stick - a candle.
- **Procedures:** -By cooperation with your classmates:
  - Fix the candle on the watch glasses.
  - Wait a little bit and see what happens

What do you observe? .....

Conclusion: .....

Some of wax melts falling on the watch glasses and freezes

Read and carry out

Activity: Collect the falling wax from melting candle and try to form a small candle from it then compare between the mass of the collected wax and the mass of the candle.

Activity (3): Grinding of sugar

- **Materials:**

A Crucible - a mortar - a cube of sugar.

- **Procedures:**
  - Put the cube of sugar in a clean mortar.
  - Ask your classmate to use the handle of the mortar in grinding

- Let your classmate taste the grinding sugar.

What do you observe? .....

Conclusion: .....

The sweety taste of sugar doesn't change and sugar still keeping its properties

Activity (4): Dissolving of table salt in water

- **Materials:** a glass beaker of 50cm^3 - a stirring rod - a crucible - a small plastic spoon - a flame - table salt.
- **Procedures:** -By cooperation with your classmates:
  - Put a little of water in the beaker.
  - Add a spoon of table salt to water in the beaker.
  - Use the stirring rod and stir the table salt in water until it completely dissolves.
  - Pour the contents of the beaker in the crucible.
  - Put the crucible on the flame.
  - Wait until water is evaporated then remove it from the flame.
  - Observe the remaining substance in the crucible.

What do you observe? .....

Conclusion : .....

Table salt remains keeping its properties without change.

Based on activities 1, 2, 3 and 4 we conclude that the change happened to ice, candle, sugar, table salt does not even change their properties and does not change their chemical structures as well, this is known as the " Physical change".

The physical change of matter: it is a change in the appearance of matter without a change in its structure.

Second: The chemical changes

There is another kind of change leads to a change in the chemical structure of matter. To indicate that, carry out the following activities:

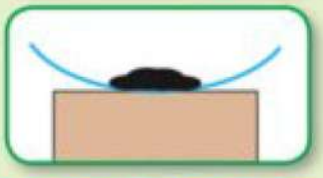
Activity (5): Burning of sugar

- **Materials:** a crucible - a small spoon - a flame - a little amount of sugar.
- **Procedures:** - Put a spoon of sugar in the crucible.
  - Ask your classmate put the crucible on the flame and record his observations .....

  Conclusion: .....

Sugar changes into brown color and loses its sweety taste in addition, it can't be returned back to its sweety form, white sugar.

Activity (6): Burning of Paper



- **Materials:** a A white paper - a flame - a glass watch.
- **Procedures:** - Bend the paper
  - With the help of your teacher. Close the edge of the paper to the flame.
  - Put the product of burning in the watch glass.
  - Compare between the characteristics of paper after and before burning

  What do you observe? .....

  Conclusion: .....

Attention!
Do not touch the burning part with your hand.

The paper burns and changes into a black substance and can't be returned back to its first form again.

Activity (7): iron rust

- **Materials:** An iron wire which is used in cleaning dishes, - scissors, crucibles - convex lens.
- **Procedures:** By the aid of your teacher
  - Cut a piece of the iron wire then put it in the crucible.
  - leave it in the wet air.
  - Examine it by the magnifying lens.

What do you observe?.....

A brittle brown layer is formed on the wire that is called "the rust"

What do you conclude? .....

From activities 5, 6, 7 we conclude that burning of sugar, paper and iron rust produced new substances that are different in their structure from the original one and this is called "chemical change".

Attention !
Do not try to cut the iron wire by your hand to avoid the wound of your fingers.

The chemical change: It is the change in the structure of a substance producing a new substnace with different properties.

Exercise: The following table shows changes that happen to substances , determine the kind of change (Physical or chemical) then give the reason.

No	The change that is happened to the substance	kind of change		the reason
		physical	chemical	
1	Breaking of chalk			
2	Burning of wood			
3	Copper malleability into wires			
4	Melting of iron			
5	Dissolving of sugar in water			

Optional activities

Choose one of the following activities then perform it:

Activity (1): Sodium bicarbonate and blowing of balloon:

Discuss your classmates the kind of change in this activity.

- **Materials:** A bottle with narrow opening - a balloon - a small spoon of sodium bicarbonate- vinegar.

Activity (2): Colour change of some fruits

Discuss your classmates how to keep the colour of some slides of fruits from changing .

- **Materials:** Lemon juice - an apple or an eggplant - a dish

Read and learn

Iron smelting doesn't change its structure. any "physical change" or adding some elements to molten iron such as carbon and manganese give iron another properties. Making it more solid and more resistant to rust. Produced iron is known as iron alloy. The same happen when adding of copper to gold.

summary

Substances are exposed to two kinds of changes:

(A) physical change: It is a change in the appearance of a matter without a change in its structure. Examples

- Change of a matter from one state into another (solid - liquid - gas)
- Dissolving of sugar
- Dissolving of table salt.
- Malleability, ductility and bending elements
- Melting of substances

(B) Chemical change: It is the change in the structure of a substance producing a new substance with different properties. Examples

- - Burning of substances (paper - wood - candle - fuel - sugar)
- - Iron rust.

Exercises and activities

Question (1): Complete the following sentences:

1- Burning of wood is considered as a ..... change .
2- Melting of ice is considered as a ..... change
3- Boiling of water and its vapour release is considered as a ....change
4- Chemical change is a change in .....
5- Rotten of fruits and their fermentation is considered as a .....change.
6- The group of elements that doesn't have lustre is known as .....

Question (2): choose the correct answer:

1- Adding table salt to water with stirring produces ...
A- a new substance **B-** a physical change **C-** a chemical change
2- ..... Is an example of the physical changes.
A- Burning of a candle **B-** Iron rust
C- Dissolving of sugar in water
3- Putting a bottle of water in the freezer of a refrigerator for a period of 24 hours causes a ..... to water
A- physical change **B-** change in structure **C-** chemical change
4- Adding yeast in baking is considered a .....
A- physical change **B-** chemical change
C- change in appearance
5- All of the following are chemical changes except .....
A- exploding of fire works **B-** burning of coal
C- formation of a salty solution

Question (3): compare

1- Melting of wax to burning of wax
2- Dissolving of sugar to burning of sugar

Question (4): Which of the following is a chemical change and which is a physical change and give reasons:

1- Paper recycling.
2-Melting of chocolate 3- Production of yoghurt from milk.

Question (5): According to your study for the changes happen to a substance- classify the following sentences into two groups and name each of them.

1- Ending in the same substance that we started with.

2- New properties appear.

3- A new formed substance differs from the original one .

4- A change in the appearance of a substance .

5- A change in the structure of a substance .

6- No formation of a new substance.

Question (6): Moisten a nail by water then expose it to the air for several days then record your observations.....

Self reflection and self evaluation

Dear student , after studying the physical and chemical changes, fill in the following card:

(A) What are the items you like in the lesson?

.....

(B) What are the items you dislike in the lesson?

.....

(C) What is the activity you like to perform with your group again?

.....

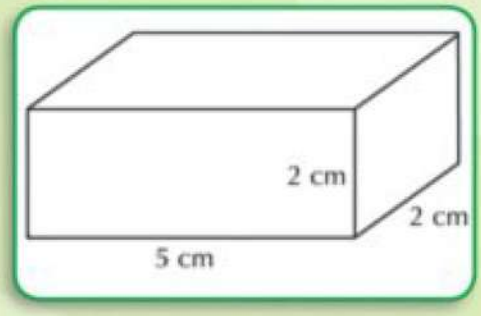
(D) Your group wants to use in order to overcome the difficulties which you have faced during the lesson activities?

.....

General exercise on unit (1)

Question (1): choose the correct answer:

1- The volume of the box shown in the figure = ... cm^3
(20 - 25 - 30)



2- When boiling water, it changes from .....
A- a solid state into a liquid one.
B- a liquid state into a gaseous one
C- a gaseous state into a solid one

3- On decreasing the temperature of water vapour, it .....
A- freezes. **B-** condenses. **C-** melts.

4- The carbon is characterized with: .....
A- good conductor of heat
B- good conuctor of electricity
C- malleable and ductile.

5- The papers used in wrapping chocolate up shows the propery of.....
A- electricity conductivity **B-** the ability for melting
C- Malleability and ductility

6- which of the following is considered as a physical change?

A- Burning of fuel B- melting of a candle

C- Iron rust

7- The change produced as a result of ductility of copper into wires is the same change produced from .....

A- making bread B- melting of iron

C- burning of coal

8- which of the following is considered as a chemical change that happens to a piece of paper?

A- Bending it B- cutting it into pieces

C- burning it

Question (2): complete the following statements:

1- changing of ice into water is considered a ..... process.

2- Increasing the temperature of water to the boiling point produces .....

3- The continuity of decreasing water temperature changes it from the ..... state to the ..... state.

4- The substance that can't be decomposed into two substances or more is known as .....

5- Elements are classified into ..... and .....

6- Group of .....has luster while the group of ..... doesn't have.

7- Graphite is a form of ..... and it is a good conductor of .....

8-Ductility of copper into wires is considered as a..... change while iron rust is considered as a..... change.

9- Melting of wax is a ..... change while burning of wax is a .....change.

10- Burning of wood is considered as a..... change.

11- Fuel of cars is ..... and its burning for the purpose of cars movement is considered as a ..... change.

Question (3): What happen when ..... and give reason:

1- Putting a bottle of water in the freezer ?

2- Boiling of water and exposing the product to a cold surface?

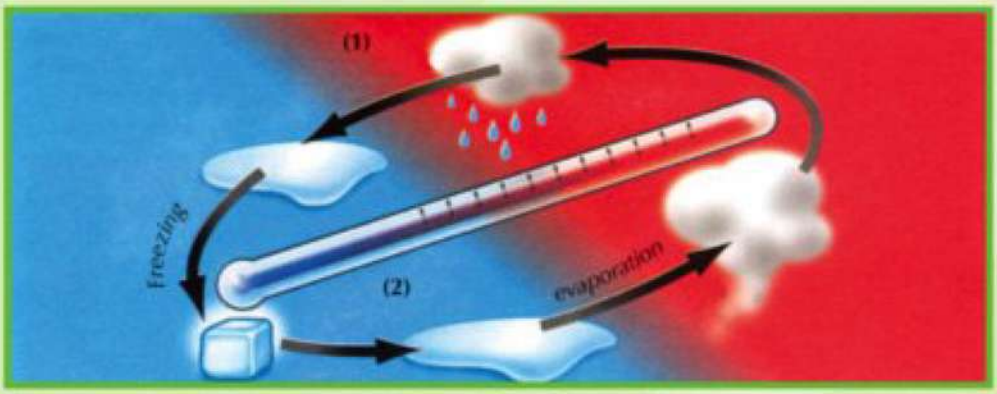
3- Putting a piece of wet iron in a jar filled with a dry oxygen?

4- Increasing the temperature and melting the ice of the two poles?

5- leaving a dish containing salty water in the air for a period of time?

6- Putting a little sugar in a beaker over a flame?

Question (4): In the following figure:



1- Number (1) is the change of matter from the..... state to the ..... one.

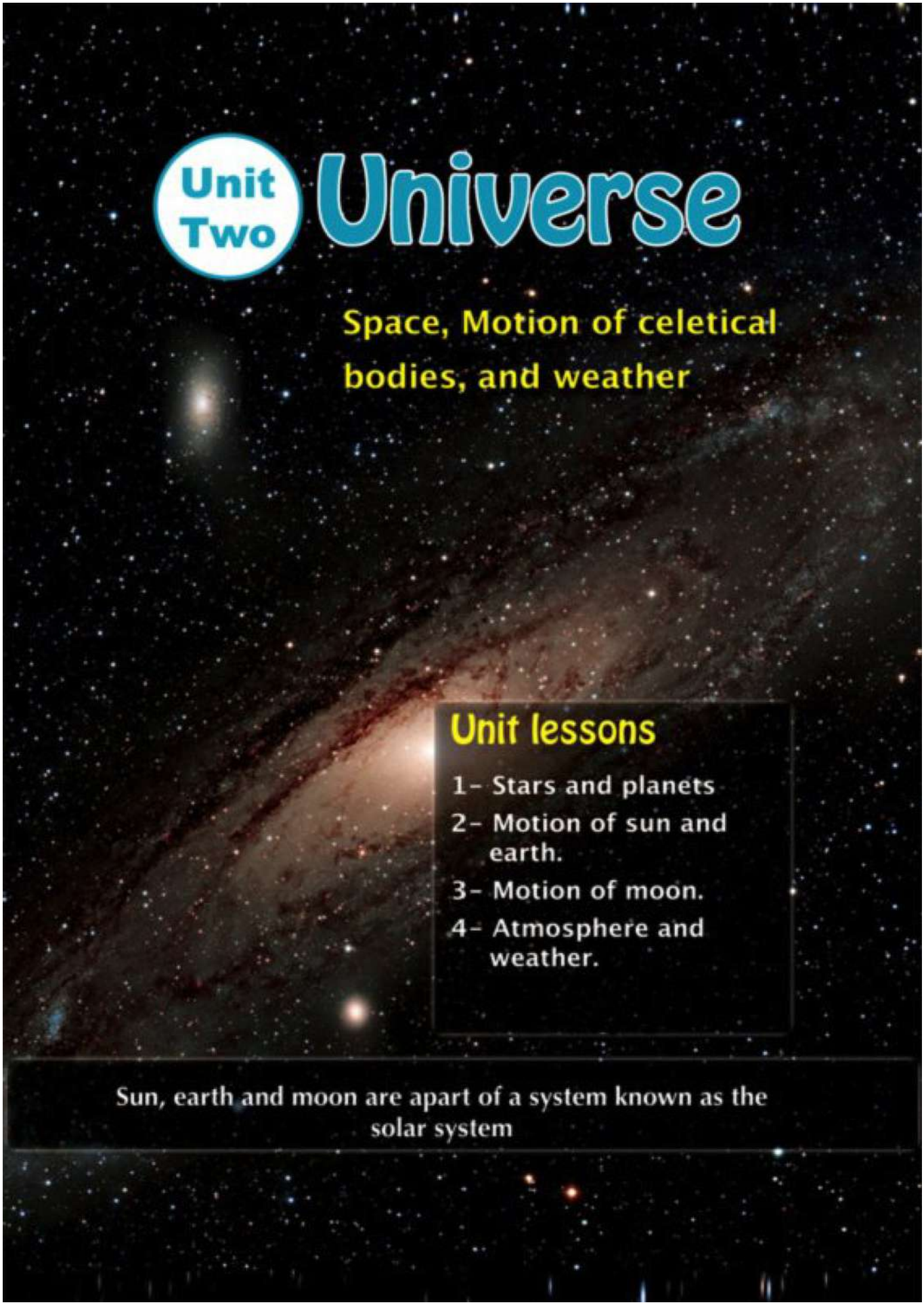
2- Number (2) is the change of matter from the ..... state to the ..... one.

3- Mention the type of change happening in this figure?

Question (5): complete the following figure:

Question (6): Tamer has left a piece of iron wire which is used in cleaning cooking pots in water and after a period of time, he recorded his observations:

- What did Tamer observe?
- Mention the type of change happens.


Unit Two
Universe
Space, Motion of celetical bodies, and weather
Unit lessons
1- Stars and planets
2- Motion of sun and earth.
3- Motion of moon.
4- Atmosphere and weather.
Sun, earth and moon are apart of a system known as the solar system

Objectives

By the end of this unit, the student will be able to:

1. Identify the universe.
2. Explain the appearance of stars as small shinning spots.
3. Identify the components of the solar system.
4. Infer that the sun is a star.
5. Compare between star, planet and the moon.
6. Conclude the presence of attraction forces among the celestial bodies.
7. Explain the natural phenomena resulting from the motion of the celestial bodies.
8. Identify the components of the atmosphere.
9. Show the importance of weather for casting.
10. Mention the apparatus used in measuring the factors of weather
11. Share his classmates in designing one of the tools used in measuring weather.
12. Make a model indicating the sequence of day and night.
13. Appreciate the grandeur of Allah for the accurate organization of the universe.

1 LESSON ONE

Stars and Planets

Lesson Objectives

By the end of the lesson, a student will be able to:

1. Explain the meaning of a star.
2. Explain the appearance of the stars in the sky as small shining spots.
3. Recognize the components of the solar system.
4. Infer that the sun is a star.
5. Recognize the number of planets and their names.
6. Compare the size of solar system planets.
7. Arrange the planets according to their distance from the sun and according to their size.
8. Compare between the stars, planets and the moon.
9. Participate his classmates to design a model of the solar system.

Lesson Items

- Stars.
- Solar system

Life Issues

- Globalization.

Stars and planets

Once you live in one of your governorate districts, you've to know that you think it is the biggest thing for you, but your governorate is a part of Egypt, and Egypt is a country of hundreds of countries of the world as well. The world represents the surface of an enormous sphere called the Earth. The Earth is floating in an immense space.

Stars

Activity (1): Stars in the sky

If you and your classmates look at the sky on a clear cloudless night, you can see some bodies spread out in the sky, these bodies have some characteristics.

Look at the following table, Put (✓) in front of the charactestices of these bodies you see in the table.

• Shining ( )	• Not Shining ( )
• Seems very small ( )	• Seems huge ( )
• Equal in size ( )	• Different in size ( )

The bodies which we see in the sky at night are known as "Stars" They are lightning bodies with different shapes in the vast vacuum which known as space.

Activity (2): The size of a distant objects

Look at these two pictures and compare the size of the plane in each one:

.....

.....

Conclusion:

.....

.....

Bodies seem small when they are distant from us.

Activity (3): Sizes of the stars.

This picture shows a group of stars we can see in the sky at night.

- What do you observe about the sizes of the stars?

.....

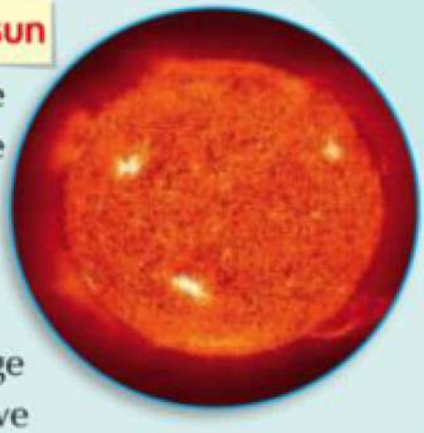
Conclusion:

.....

The stars seems very small because they locate far apart from us.

Solar System

Activity (4): Description of the sun



Look at the sun during day time with a sunglasses then answer these questions:

- Is the sun a star? why?

  .....

- Why does the sun seem very large in comparing with other stars that we see in the sky at night? .....

The sun is a shining star radiates light and heat, it is the nearest star to us.

Activity (5): Description of planets.

Look at the opposite figure it is indicating the solar system then, answer the following questions.

1- Write the names of planets arranged from the nearest to the farthest to the sun.

2- the number of planets which revolve around the sun equal:.....

3- The nearest planet to the sun is .....

4- the farthest planet to the sun is .....

5- The biggest planet is .....

6- The smallest planet is .....

Activity (6): Rotation of the planets

■ Materials:

White paper - a large plastic ball, - 8 plastic balls of different sizes - an aluminum wire - clay.

■ Procedures:

- Colour the balls in different colours
- Fix the largest ball in the middle of the paper
- Using the aluminum wire to make circles, each wire passes through one of the balls.
- Fix the circles by using the clay
- Move the balls through the wire around the large ball.
- Describle the movement of the balls

.....

.....

- The conclusion:

.....

The balls rotation around the large one looks like the rotation of the planets around the sun.

Read and learn

On Thursday 24, August 2006 the International astronomical union hold a general board meeting in Czech where 2500 astronomer attended by the end of the conference meeting they decide that pluto planet is excluded from the solar system because of its small size whereas its size is less than one fifth of earth's size.

Planets are dark bodies revolve around the sun in fixed orbits there are eight planets, these planets are arranged from the nearest to the farthest from the sun as following: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

Identify the planets of the solar system:

Mercury
The nearest planet to the sun

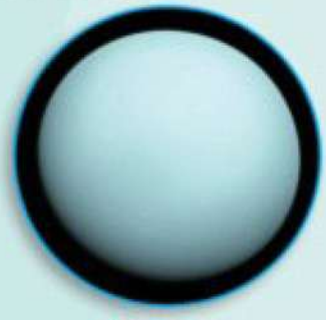
Venus
The most beautiful planet

The earth
The plant where we live
Earth planet is a Water planet
That occupies most of the water

Mars
Known as the red planet
to the presence of iron metal in the rocks

Jupiter
The biggest planet
agiant

Saturn
A big number of colored rings which rotate around it



Uranus
The cold planet

Neptune
known as The blue planet

Activity (7): The moon

If you look at the sky at night in the middle of the lunar month, you might see a shiny body

- Describe this body.

.....

- Why do you see this shining body?

.....

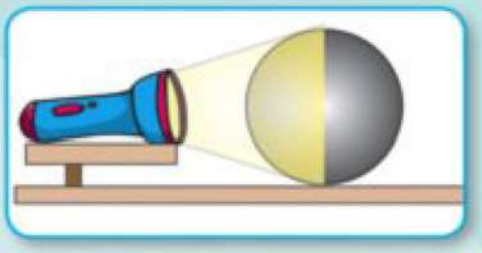
- To answer the previous questions you can do this activity:

Activity (8): we see the moon shining

■ Materials:

A small plastic ball - foil paper

- A Torch.



■ Procedure:

- Cover the ball with the foil paper (representing the moon)
- Darken the class.
- can you see the ball in the dark?.....
- Using the pocket torch (representing the sun) towards the ball.
- What do you watch?.....
- Conclusion:.....

The moon: is a dark body revolves around the earth, it reflects the light of the sun, thus it seems shiny.

The solar system is consisted of:

1- **The sun:** is the center of the solar system.
2- **Planets:** dark bodies, they are eight planets which revolve around the sun in fixed orbits,.
3- **Moons:** followers to the planets revolving around some planets
4- **celestial bodies:**asteroids, comets, meteors and meteoroids.

Read and learn

The number of the moons which revolving around the planets (from NASA web site):

1- Mercury	no moons
2- Venus	no moons
3- Earth	One
4- Mars	Two
5- Jupiter	62
6- Saturn	60
7- Uranus	27
8- Neptune	13

Exercise:

Compare among the star, planet and the moon.

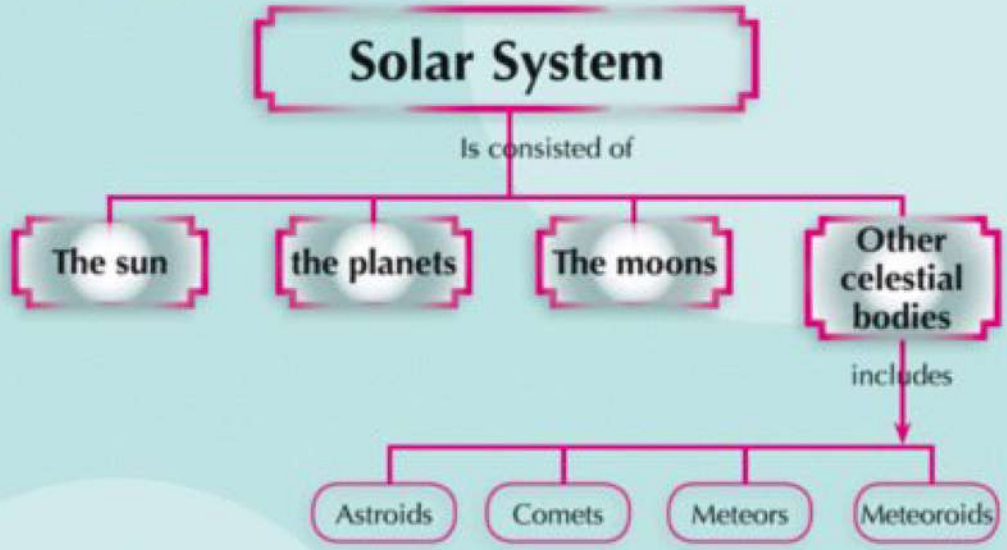
star	planet	moon
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

Optional activities

Choose one of the following activities, then carry it.

1- Draw a model of the solar system.
2- Make an album containing the solar system planets photoes and comment on every picture.

Summary



Exercises and activities

Question (1):

1- The nearest planet to the sun is.....

A- The earth **B-** Mercury **C-** Neptune **D-** Jupiter

2- The biggest planet is.....

A- The earth **B-** Mercury **C-** Neptune **D-** Jupiter

3- The sun is a star because it.....

A- absorbs light **B-** reflects light

C- radiates light **D-** let light pass through

4- We see the moon shinning because it .....

A- absorbs light **B-** reflects light

C- radiates light **D-**lets light pass through it light pass.

Question (2): complete the following:

1- The..... is located in the center of the solar system and there are..... revolving around it in definite orbitals.

2- The earth is located between ..... and ..... .

3- The..... is the smallest planet while..... is the farthest planet from the sun.

4- Mars is known as ..... , while Neptune is the ..... .

Question (3): Give reasons:

1- The sun is a star while the earth is a planet.

2- The stars seem very small in size.

3- The moon is dark body but we see it shining.

Question (4): compare the planet to the star.

Question (5): Draw the solar system, then colour the following planets:

1- The largest planet in green.

2- The smallest planet in yellow.

3- The planet which we live on, (in blue).

Self reflection and self evaluation

After studying this lesson fill in this card:

(A) What are the items you like in the lesson?

.....

(B) What are the items you dislike in the lesson?

.....

(C) What is the best comment you have received concerning your performance in the lesson of stars and planets?

.....

(D) What are the problems that you face while carrying out the activities of this lesson? and how could you overcome them?

.....

2 LESSON TWO

The rotation of sun and earth

Lesson Objectives

By the end of the lesson, a student will be able to:

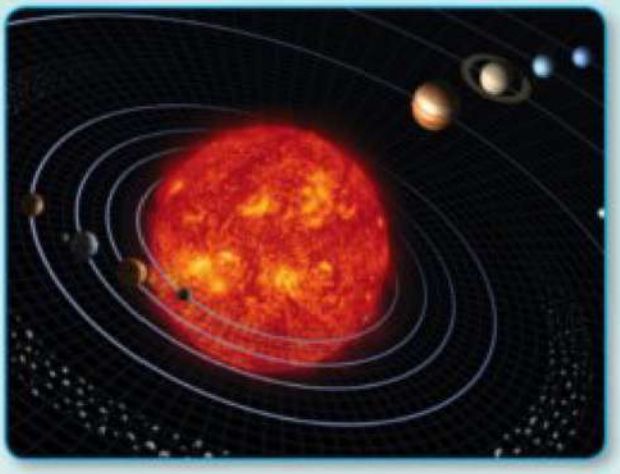
1. Recognize the rotation of sun and earth.
2. Design an experiment showing the day and night sequence .
3. Design an experiment showing the sequence of seasons.
4. Explain the sequence of day and night.
5. Explain the sequence of seasons.

Lesson Items

- Rotation of the sun.
- Rotation of the earth.
- Day and night sequence.
- Sequence of seasons of the year.

Life issues

- Man and the space



Stars, planets and moons are traveling in the space, all of them are in a continuous rotation and known as celestial bodies. we can see millions of stars in the sky, the sun is one of these stars, it seems larger than all other stars because it is the nearest one to us. the sun is in continuous rotation.

The rotation of the sun

Activity (1): Interpretation to the sun apparent rotation.

(A) Using a sunglasses, observe the rotation of the sun during day

- Record your observation about the rotation of sun

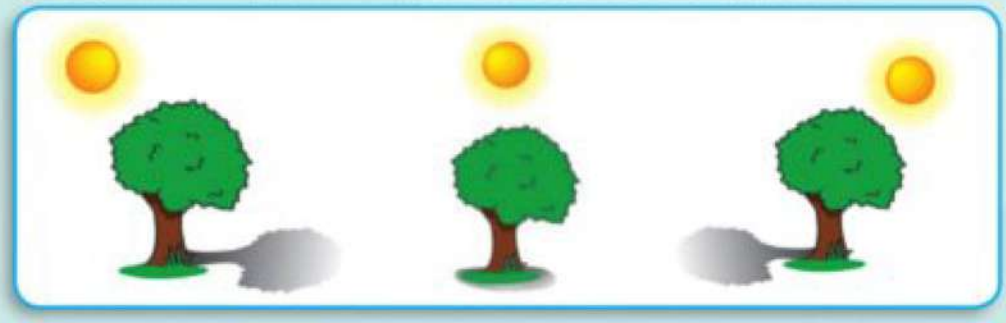
.....

- The sun rises in east and sets to the west, at midday it is in the middle of the sky.

Attention!

Looking directly to the sun is harmful for your eyes

(B) Track the shadow of a tree in the following times:



1- During the sun rise.

2- During the midday.

3- During the sun set.

- Record your observations about the movement of the shadow of the tree.

.....

- The conclusion:.....

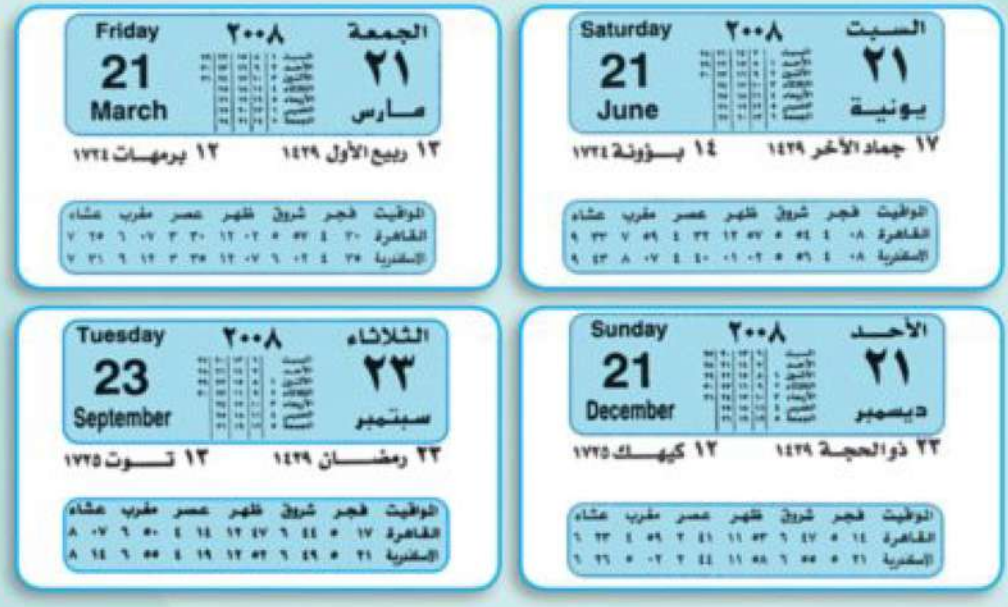
The movement of the shadow is a result to the apparent rotation of the sun.

The apparent rotation of the sun

The sun seems moving from east to west, because the earth rotates around its axis and not to the rotation of the sun.

Activity (2): Pathes of the sun in the sky

Look at the following calender then complete the table.



Day	Number of the hours of the day	Number of the hours of the night	season
21st June	.....	.....	Summer
23th September	.....	.....	Fall
21st December	.....	.....	Winter
21st March	.....	.....	Spring

Look at the table then complete the following:

- Day is longer than night in ...
- Day is shorter than night in ....
- The hours of the day equal to the hours of the night during ..... and .....

- **The sun takes different apparent orbits from east to west.**
- **A summer day is longer than the winter day because the apparent orbit of the sun in summer is longer than the apparent orbit of the sun at winter.**

Read and learn

The sun clock:

The first clock discovered was depending on the length of the shadow and its direction. The ancient Egyptians called it the shadow hour. Early muslims used it to determine the times of praying.

The rotation of the Earth:

We live on earth, we get up in the morning doing our works, at night we sleep, how can we explain the day and night sequence?

Activity (3): The day and night sequence:

■ Materials:

- A plastic ball - a pencil or a large needle a torch - a pin

Read and learn

Axis of the earth:

It is unreal straight line passes through the center of the earth.

■ Procedures:

- pass the needle or the pencil through the center of the ball. The ball represents the earth while the pencil or the needle represents the axis of the rotation of the earth.
- Fix the pin in specific place on the ball surface .
- Ask your classmate to help you fix the axis of the ball in a vertical position (Figure 1).
- Darken the room.
- Switch on the torch (represents the sun) towards the fixed side of the pin found.
- Have your friend let the ball rotate around itself.

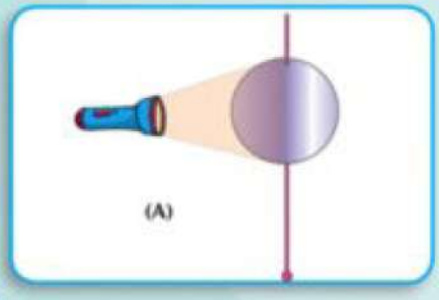
What do you observe? .....

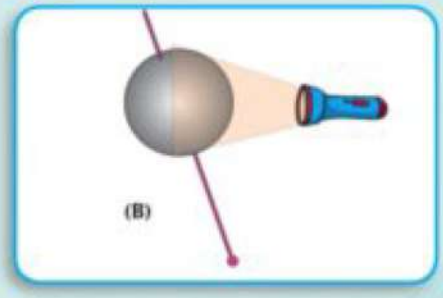
Conclusion: .....

Repeat the steps with inclined axis and rotate the ball around itself again as in figure (b).

What do you observe?.....

Conclusion:.....





- In both cases, the pin will be located inside light area at one time. In this case, it represents the day time. And at the other case will be located in the shadow area representing the night.
- When the axis is vertical, the hours of day time are equal to the hours of night time, but in the case of inclined pin the hours of day time is different than the hours of night time.

Now, do you think the axis of the earth is vertical or inclined?.....

The earth rotates around its axis once every 24 hours causing day and night. The hours of day is not equal to the hours of night because the axis of the earth is inclined

Activity (4): A model of the earth and seasons of the year.

■ Materials:

A model of the earth - an electric bulb, a wire or a rope.

■ Procedures:

- Put the model of the earth on the Table (the north half of the model is inclined to the bulb) as in Figure (A)

- Do the people who live in the north part of the earth have a longer day than night?
- which season of the year do they live in?

Record your observations .....

Conclusion: .....

- Move the model of the earth around the bulb and the southern half of the earth is inclined towards the bulb as in Figure (B)
- Do the people who live in the northern half of the earth having a longer day than night?
- Which season of the year do the people who live in the northern of the earth live?

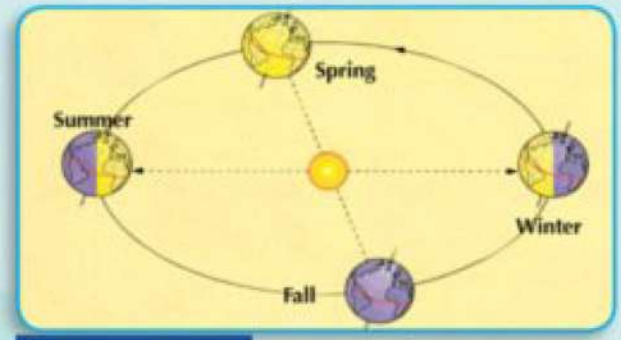
Record your observations:.....

Conclusion:.....

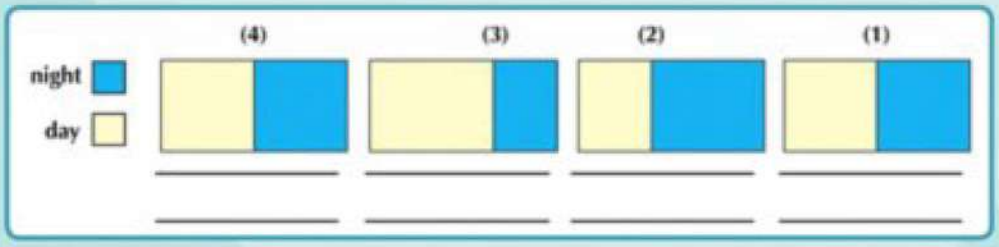
- **The earth revolves around the sun once every 365 and quarter a day causing the sequence of the seasons.**
- **The earth rotates around its axis causing the sequence of day and night.**

Read and learn

As the Southern pole is inclined Towards the sun so it is always day for six months, at the same time it is night at the northen pole, that is because it is for away from the sun and vice - versa after six months.



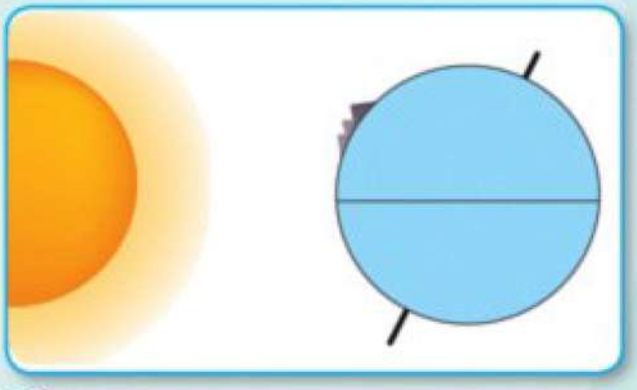
Exercise: **Here are 4 figures indicating the day and night during 24 hours, write the suitable seasons under each one.**



Optional activities

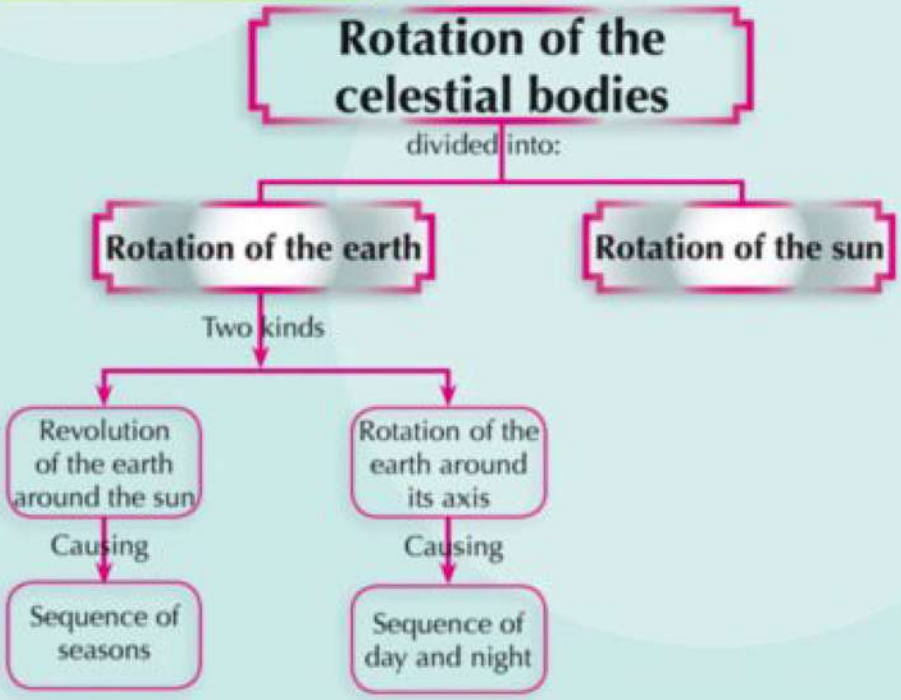
Choose one of the following activities, carry it out:

1- The following drawing shows the location of the pyramids on the surface of the earth.
- Draw the location of the pyramids on the earth after 12 hours.



2- Draw a model showing the sequence of day and night.

Summary



Exercises and activities

Question 1:choose the correct answer:

1- The sequence of day and night is occurred due to .....

A- revolution of the earth around the sun.

B- rotation of the earth around its axis.

C- rotation of the sun around its axis.

2- The number of the day hours are equal to the number of the night hours in:

A- summer **B**- winter

C- spring **D**- all of the seasons

3- The sequence of the seasons of the year is occurred due to:

A- revolution of the earth around the sun.

B- rotation of the earth around its axis.

C- rotation of the sun around its axis.

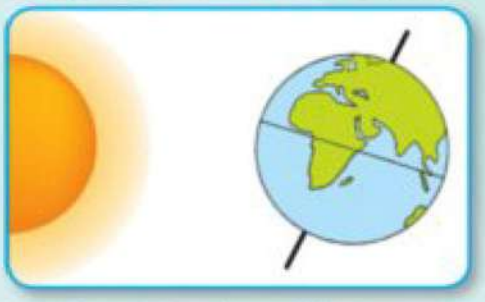
Question 2: The Following table shows the time of sun rise and the time of the sun set in two different dayes .

Days	Time of sun rise		Time of sun set	
	Hour	Minute	Hour	Minute
First day	6	43	5	43
The other day	5	44	7	44

1- From the table above, calculate the day hours each time.

2- write the name of a suitable season for each day of the table.

Question 3: Look at the opposite drawing and answer the questions:



1- Is Egypt located in the northern or southern half of the earth?
2- According to the figure. Does Egypt pass day or a night?
3- If the number of day hours is 11 hours in Egypt. Which season does Egypt pass?

Question 4:

1- The day is longer than the night in.....

2- In..... and ..... the day equals the night.

Question 5: Make a model shows the consequence of the seasons of the year.

Self reflection and self evaluation

After studying the rotation of the sun and the earth, complete the following card:

(A) What are the items you like in the lesson?

.....

(B) What are the items you dislike in the lesson?

.....

(C) What is the beautiful comment you have received concerning your performance to the sun and earth motion?

.....

(D) What are the problems that you face while carrying out the activities of this lesson? and how you overcome them?

.....

3 LESSON THREE

Motion of The Moon

Lesson Objectives

By the end of the lesson, a student will be able to:

1. Recognize the motion of the moon.
2. Compare between the motion of sun, earth and moon.
3. Conclude the phases of the moon.
4. Explain the tide and ebb.
5. Determine the importance of tides and ebbs
6. Conclude the presence of attraction forces among the celestial bodies.
7. Have his classmates write about motion of the moon.

Lesson Items

- Motion of the moon.
- Phases of the moon
- Attraction forces among celestial bodies
- Tide and ebb.

Life Issues

- Globalization.

When we look at the sky, at night, we see the moon shinning because it reflects the sun light that falls on it. That is mean that the moon is a dark object reflect the sun light

Activity (1): Tracking the phases of the moon

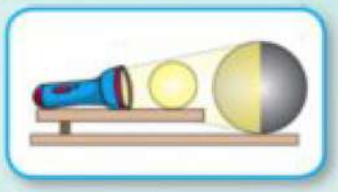
At night, look at the sky, watch the moon and draw its shape. After some days. Look at the sky, does the moon has the same shape, why? .....

To answer this question, try to perform the following activity.

Activity (2): Explore the motion of the moon

■ Materials:

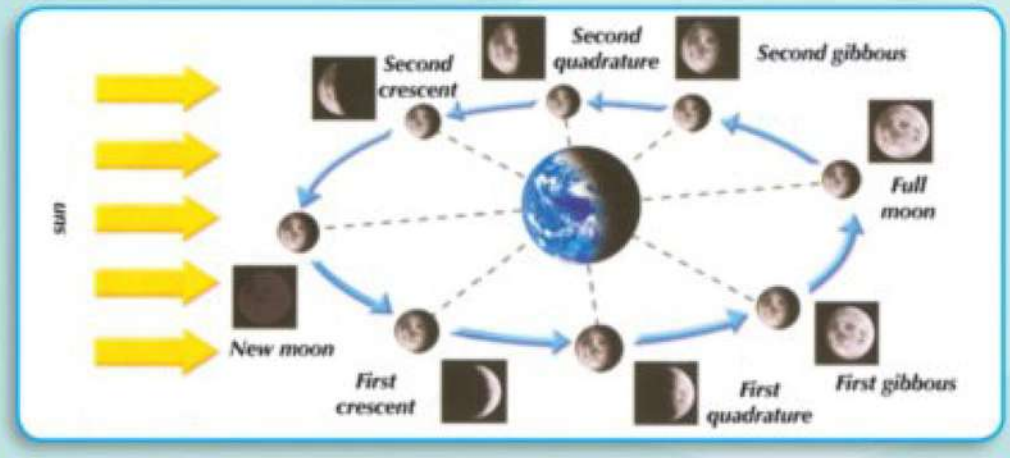
- A small ball, a big plastic ball - foil paper - a pocket torch.



■ Procedures:

- Put the big ball (representing the earth) on the table.
- Place the torch (representing the sun) on the table in front of the big ball.
- Cover the small ball (representing the moon) with the foil paper and place it between the big ball and the torch.
- Darken the room and lighten the torch. What do you observe? .....
- Move the small ball (moon) in a circular orbit around the big ball (earth) what do you observe? .....
- Draw the shape of the lightened part of the small ball.

conclusion:.....



The moon rotates around its axis, and around the earth once every about 28 day. As a result of moon revolution around the earth, the size of the area reflecting the sun light on the moon changes and that's why we see it shining, it begins in the form of a crescent then half of the moon becomes shining and after awhile it becomes full moon. The other part becomes shining then changes into a crescent. All of these different phases are called the phases of the moon.

Observe and compare **Read and learn**

Phases of the moon

Attraction among celestial bodies

Activity (3): The attraction forces among the sun, earth and the moon.

■ Materials:

A wire - a rubber or a piece of plastic.

■ Procedures:

Tie the rubber with the wire. Hold the wire, revolve it quickly around your hand (your hand represents the sun and the rubber represents the earth).

What do you observe? .....

Consider your hand is the earth and the rubber is the moon.

What do you observe? .....

What is the conclusion in both cases? .....

Revolving of the rubber around your hand as in the first case is the same as the revolution of the earth around the sun but in the second case its revolution is similar to the revolution of the moon around the earth.

Attraction of the rubber towards your hand and its rotation in a definite orbit is similar to the attraction of the earth and both the sun and the moon.

There are attraction forces among the celestial bodies, there is an attraction force between the earth and the sun and between the earth and the moon as well.

Read and learn

The difference between the lunar year and solar year:

Solar year equals $365\frac{1}{4}$ day but the lunar year equals 354 day the difference between them 11 days.

The tide and ebb

Water covers about 71% of the total area of the earth, and the largest water bodies are: oceans, seas and lakes.

Tide: is the rising of the water level to extend that water covers the seashores. The maximum of the rising is at the middle of the lunar month (When the moon is full).

The ebb: It is when the water returns back to its normal level after the tide.

Why tide and ebb happens? It is due to the attraction between the earth and the moon, and the attraction happens between the earth and the sun as well.

But the moon is considered the main reason for tides and ebbs because it is nearer to the earth than the sun is.

Activity (4): Water falling effect

Put a plastic fan under a water tap (as you see) and let water fall down from the tap.

What do you observe? .....

Conclusion: .....

The rushing of tap water rotates the fan, this is the idea of the turbines. The turbines are rotated by the falling of water or by air pushing to produce electricity.

The benefits of tide and ebb:

Water currents resulted from tide and ebb phenomenon works on :

1- **Generating electricity:** the flowing of water during a tide and its retraction during an ebb, makes the turbines rotate to produce electricity.
2- **Cleaning the coasts:** water carries the wastes from coasts to the seas bottoms in where they are settled.
3- **Cleaning the water canals to keep its depth**.
4- **Ships and boats** access to the shallow water paths.

Optional activities

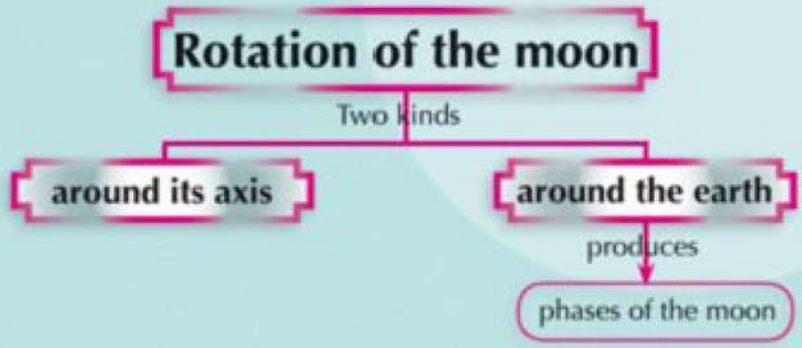
Choose one of these activities, and carry it out :

- Look at the sky every day of the month, then draw the phases of the moon and compare among these phases .

Day of the lunar month	shape of the moon	Day of the lunar month	shape of the moon
4th day		21st day	
15th day		25th day	

- Write a paragraph about the importance of the rotation of the moon in determining the beginning of the lunar months.
- Design a table showing the difference between the rotation of the earth and the moon and the resulted phenomena from the rotation of these bodies.

Summary



Tide and ebb phenomenon is resulted from the attraction of both the sun and the moon to the earth.

Exercises and activities

Question (1): Choose the correct answer:

1- The attraction of the earth and the moon results in .....

(A) day and night (B) seasons of the year

(C) tide and ebb (D) Phases of the moon

2- In the middle of the lunar month, the moon's phase is .....

(A) crescent (B) full

(C) first quadrature (D) second quadrature

3- We can depend on tides phenomena to generate.....

(A) electricity (B) petroleum (C) coal (D) natural gas

4- The phases of the moon is resulted from .....

(A) rotation of the earth around the sun

(B) rotation of the earth around its axis

(C) rotation of the moon around its axis

(D) rotation of the moon around the earth

5- The maximum tides when the moon is in the.....

(A) first quadrature (B) second quadrature

(C) crescent (D) full moon

Question (2): If you live in a coastal city, what is the phenomena used for generating electricity in your area? How?

Question (3): Explain the following cases:

1- The moon is dark object but we see it shining at night.

2-Formation of tides

3 -Formation of the phases of the moon

Question (4): what are the benefit of tides

Self reflection and self evaluation

After studying this lesson, fill the following table:

(A) What are the items you like in the lesson?

.....

(B) What are the items you dislike in the lesson?

.....

(C) What is the best comment you have received concerning the lesson of moon motion?

.....

(D) Have you got admired by the optional activities? why did you choose the activity you performed?

.....

4 LESSON FOUR

The atmosphere and the weather

Lesson Objectives

By the end of the lesson, a student will be able to:

1. Explain the atmosphere and its components.
2. Explain the importance of the atmosphere
3. Recognize the natural phenomena of weather.
4. Mention the apparatus used in measuring the weather factors.
5. Expect the weather in his area broadcasting.
6. Explain the importance of the weather.
7. Appreciate the grandeur of Allah in creating atmosphere.
8. Have his classmates listen and follow the weather broadcasting.

Lesson Items

- The atmosphere of the earth.
- The phenomena of weather.
- The measuring instruments.
- Weather broadcasting.

Life Issues

- The atmosphere and life.

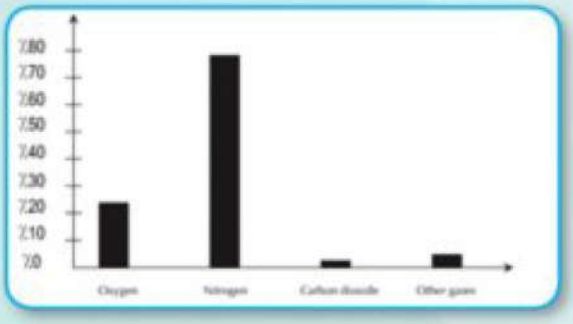
Living organisms need air to live, the earth has a suitable atmosphere for living organisms, The atmosphere is consisted of some gases.

To recognize the components of the atmosphere, you can do this activity:

First: The components of the atmosphere:

Activity(1): this graph shows the components of the atmosphere

The gas	% in the atmosphere
oxygen	..... %
Nitrogen	..... %
carbondioxid	0.03%
other gases	0.97 %



Read and learn

jupeter, Mars and Venus planets have atmosheres but not suitable of the life of the living organisms becouse they do not contain oxygen and water.

What do you observe?.....

Conclusion:.....

The atmosphere is consisted of some gases: Oxygen, Nitrogen, Carbon dioxide, water vapour and other gases.

1- Oxygen gas:

- This gas represents about 21% of the volume of the atmosphere (about $\frac{1}{5}$ of the volume of the atmosphere)

Read and learn

- The main source of oxygen on the earth is the green plants during the process of photosynthesis

The importance of Oxygen:

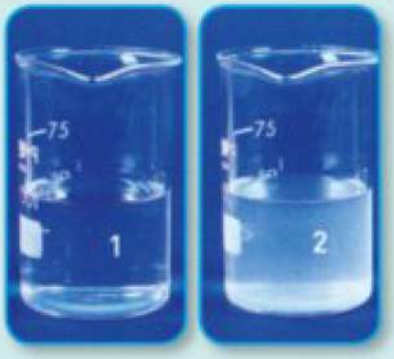
- Necessary for the respiration of the living organisms.
- Helps in burning fuels.

Divers use oxygen in breathing under water

Oxygen and acetelene are used in welding metals

2- Carbon dioxide:

Activity(2): Prove the presence of carbon dioxide in the atmosphere



- Place a cup of glass containing clear lime water for a period of time at air.

What do you observe: .....

Conclusion: .....

- Carbon dioxide gas is found in the atmosphere with a very one few percent 0.03%, it changes the clear lime water into milky one.

The importance of carbon dioxide gas:

- Green plants use this gas in making their food during the process of photosynthesis.
- Used in making soda water.
- Helps in fires extinguish because it doesn't burn or even help in burning.

Read and learn

The increase of carbon dioxide ratio in the atmosphere rises its temperature.

Green plants use carbon dioxide in the process of photosynthesis.

3- Nitrogen gas:

- 78% of the air is nitrogen.

The importance of nitrogen:

- Decrease the effect of oxygen in the process of combustion.
- In the industry of ammonia and nitrogenous fertilizers.

4- Water Vapour:

Activity (3): Prove the presence of water vapour in the atmosphere

- put some pieces of ice glass cup, leave it for few minutes.

What do you observe on the outer surface of the cup? .....

.....

Conclusion: .....

The atmospher contains water vapour.

- The humidity of the atmosphere depends on the amount of water vapour in the atmosphere.

Read and learn

The humidity increases in the coastal areas due to the increase of water in the atmosphere.

Second: Weather

Mass media representatives do their best to prepare a daily weather forecast. What is the importance of this daily weather forecast?

Activity (4): The benefits of studying weather

- Read the opposite weather forecast then determine the weather phenomena in it
  - .....
  - .....
- What is the advice you give to the people living in the coastal areas?

The weather forecast

The weather tomorrow morning, will be little cold on the Northern coasts, warmer in the other areas, very cold at the evening for the whole country, medium clouds formed on the North accompanied with expected rains on the northern coasts. Vision decreases due to the morning fog covering the northern areas and Cairo.

Further more the wind will be Northen - east wind mild to a medium speed.

weather: the expected condition of the atmosphere in an area during a short period of time not exceeding one week.

Studying of some weather phenomena

The weather forecast includes weather factors. The weather factors are temperature, atmospheric pressure, winds, clouds and rains.

1- Temperature: The following table shows the recorded temperatures on one day in February, it shows the maximum and minimum recorded temperatures of some cities.

City	Maiumum temperatures	Minimum temperatures
Cairo	22	10
Alexandria	18	8
Damiatta	20	10
ElArish	21	9
Sharm Elsheikh	26	13
Assuit	25	8
Aswan	28	12

- **The maximum temperature:** It is the heighest expected temperature during the day time.

Mercury thermometers

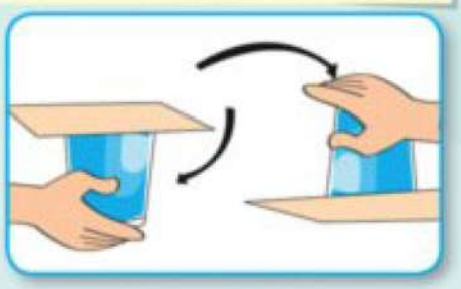
Digital thermomter

- **The minimum temperature**: it is the lowest expected temperature during the night time.
- The temperature is measured by the mercury thermometer or by the digital thermometer.

2- The atmosphereic pressure:

Activity (5): The cub of water and atmospheric pressure

- Fill a cup with water completely. Then cover it with white paper.
- carefully, turn the cup up side down



What do you observe? .....

Conclusion: .....

Water does not fall from the cup because of the atmospheric pressure equals to water pressure in the cup.

- There are places with high atmospheric pressure and other places with low atmospheric pressure.

- The barometer is used to measure the atmospheric pressure .

Barometer

3- Wind:

- Winds are the movement of air from high pressure areas toward lower pressure areas
- The speed of winds causes the rising of waves of the sea.
- Wind speed is measured by an apparatus known as anemometer
- Vane determines the direction of the winds.

Vane

Anemometer

4- clouds and rains:

Formation of clouds: The sun rays evaporate the water changing it into water vapour when it rises in the sky, it is cooled and condensed forming clouds.

Falling of rains: winds move the clouds, then it changes into drops of water, air can not carry these drops thus it falls as rains.

Exercise:

- This map shows assembling of clouds over some cities, there is a chance for rains falling.
- Which cities have more clouds?

  .....
- Which cities do you expect having a lot of clouds? .....
- Which cities have clear sky? .....

The importance of weather prediction:

- People normally follow the weather forecast in the mass media (radio - TV - news papers - internet) it includes the expected temperature, movement of winds, fog and rains in order to face these conditions.
- If predicting a lower temperature, people have to protect themselves through wearing heavy dresses
- Predicting strong wind below ups, sea waves are to be risen, ships and fishing boats are advised not to sail.
- Predicting a foggy morning, car drivers are to stick to the speed limits in a trial to a void accidents.

Optional activities

Choose one of these activities, then carry out it.

1- making a vane :

■ Materials:

Drawing paper - wooden rode - a pin scissors - pencil.

■ Procedures:

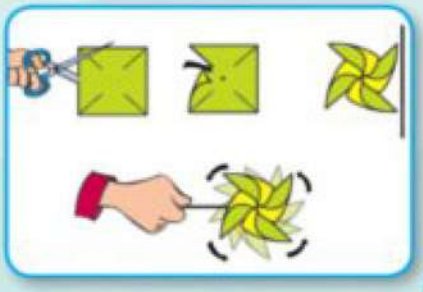
Draw a square or circle on the drawing paper and draw lines as shown in the figure.

Read and learn

Torrents :

Torrent happens as a result of the assemble of water rains in huge amounts and its pushing from higher areas to lower areas.

Egypt is one of the countries threatened with torrents, specially souhag, Assuit and Sinai.



- Use the scissors, cut the paper according to the drown lines.
- Fix the paper on the wooden rode by using the pin.

2- Fill this table with the suitable behavior:

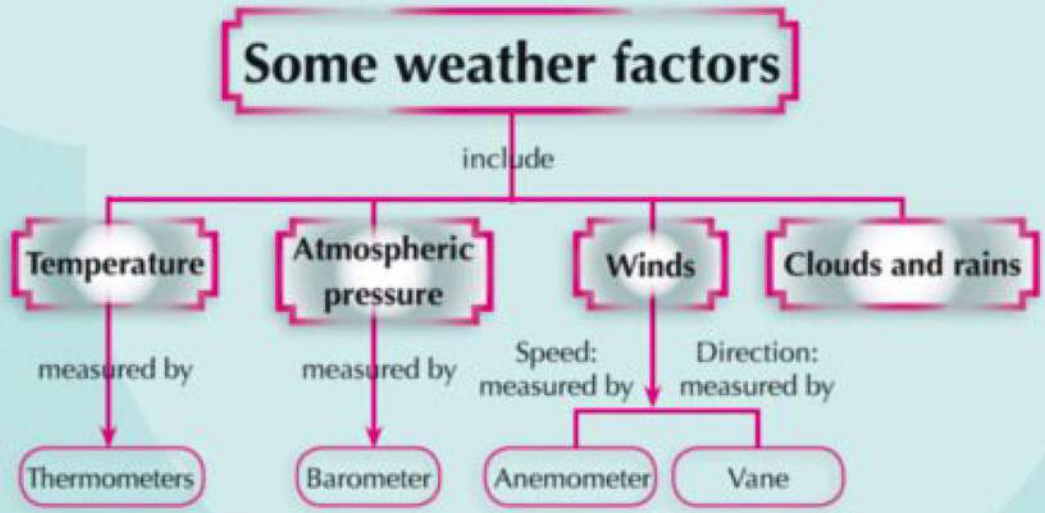
Expected weather	Suitable behavior
1- Decreasing in the temperature.	.....
2- Strong winds.	.....
3- Rising of the waves of the sea.	.....
4- Formation of fog in the morning.	.....

3- Write a paragraph about the importance of the atmosphere for the living organisms.

Summary

The components of the atmosphere

Gas	1 Oxygen	2 Nitrogen	3 Carbon dioxide	4 Other gases	5 Water vapour
ratios	21 ٪	78 ٪	0.03 ٪	0.97 ٪	Changing ratios



Exercises and activities

Question one: Choose the correct answer:

1- The speed of the wind is measured by .....

(A) Thermometer **(B)** Anemometer

(C) Barometer **(D)** Vane

2- The barometer is used for measuring .....

(A) The temperature **(B)** Wind speed

(C) Wind direction **(D)** Atmospheric pressure

3- A gas represents $\frac{1}{5}$ of the volume of the atmosphere is .....

(A) Oxygen **(B)** Nitrogen

(C) Carbon dioxide **(D)** Hydrogen

4- A gas changes the clear lime water to milky is .....

(A) Oxygen **(B)** Nitrogen

(C) Carbon dioxide **(D)** Hydrogen

Question two: Complete the following:

1- Green plants depend on ..... gas in the process of photosynthesis.

2- Nitrogen gas is used in..... and .....industries.

3- ..... is used to determine the direction of the winds.

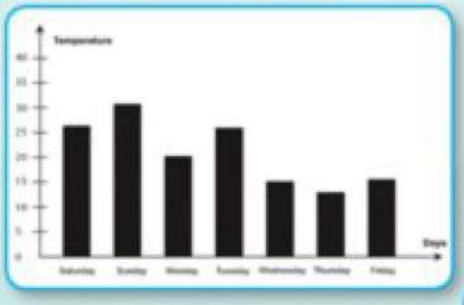
Question three: What is the importance of predication of the weather?

Question four: This graph shows the temperature of the days of this week:

-What is the recorded temperature at Tuesday?

- Which day the highest temperature is recorded?

Which day is the coldest?



Question five: What do you advice your classmates in the following, weathering conditions:

1- If the recorded minimum temperature is 5 degrees.

2- Forming heavy clouds on some areas and expecting of falling rains.

3- Blowing of strong winds in some coastal areas.

4- Heavy fog is formed in some roads during the early morning.

Question six: Follow the weather forecast (in T.V or newspaper), then determine some of the weather phenomona at this day.

Self reflection and self evaluation

After studying this lesson, answer the following question:

(A) What are the items you like in the lesson?

.....

(B) What are the items you dislike in the lesson?

.....

(C) What is the beautiful comment you have received concerning your performance to the activities of measuring tools?

.....

(D) What are the problems that you face while carrying out the activities of this lesson? and how you overcome them?

.....

General exercises on Unit two

Question (1): choose the suitable word:

1- Stars are (shinning - dark) bodies with (equal - different) sizes. while the planets are (shining - dark) bodies.

2- The number of the planets in the solar system is (6 - 8) revolves around (the moon - the sun) in definite orbits.

3- The nearest planet to the sun is (Jupiter - Mercury) and the farthest planet is (Uranus - Nepton) while the biggest planet is (Juputer - Venus).

4- Day and night happen because of the rotation of the (sun - earth) around its axis while the seasons of the year happen because of the rotation of the (earth - moon) around the sun.

5- At the first week from the lunar month, the shape of the moon is (crescent - fullmoon) and in the middle of the month it is (crescent - fullmoon).

6- The percentage of oxygen in the atmosphere (78% - 21%) and the green plants use it in (respiration - photosynthesis) process.

7- The atmospheric pressure is measured by (barometer - anemometer) while the the speed of the wind is measured by (anemometer - vanes).

Question (2): Write the scientific term:

1- Dark objects revolve around the sun in fixed orbits.

2- Dark objects revolve around the earth and reflect the sun rays falling on them.

3- A phenomena resulting from the attraction between the earth and both of the moon and the sun.

4- Motion of the air from higher pressured areas to lower pressured areas.

Question (3): What is type of the phenomena resulted from:

1- Rotation of the earth around its axis.

2- Rotation of the earth around the sun.

3- Rotation of the moon around the earth.

4- The attraction between the earth and both of the moon and the sun.

Question (4): Compare between:

1- Star - planet.

2- Tide - ebb.

Question (5): What is the importance of the weather forecasting for:

(1) Farmers (2) Fishermen (3) Car drivers

Question (6): Share your friends in making an activity shows:

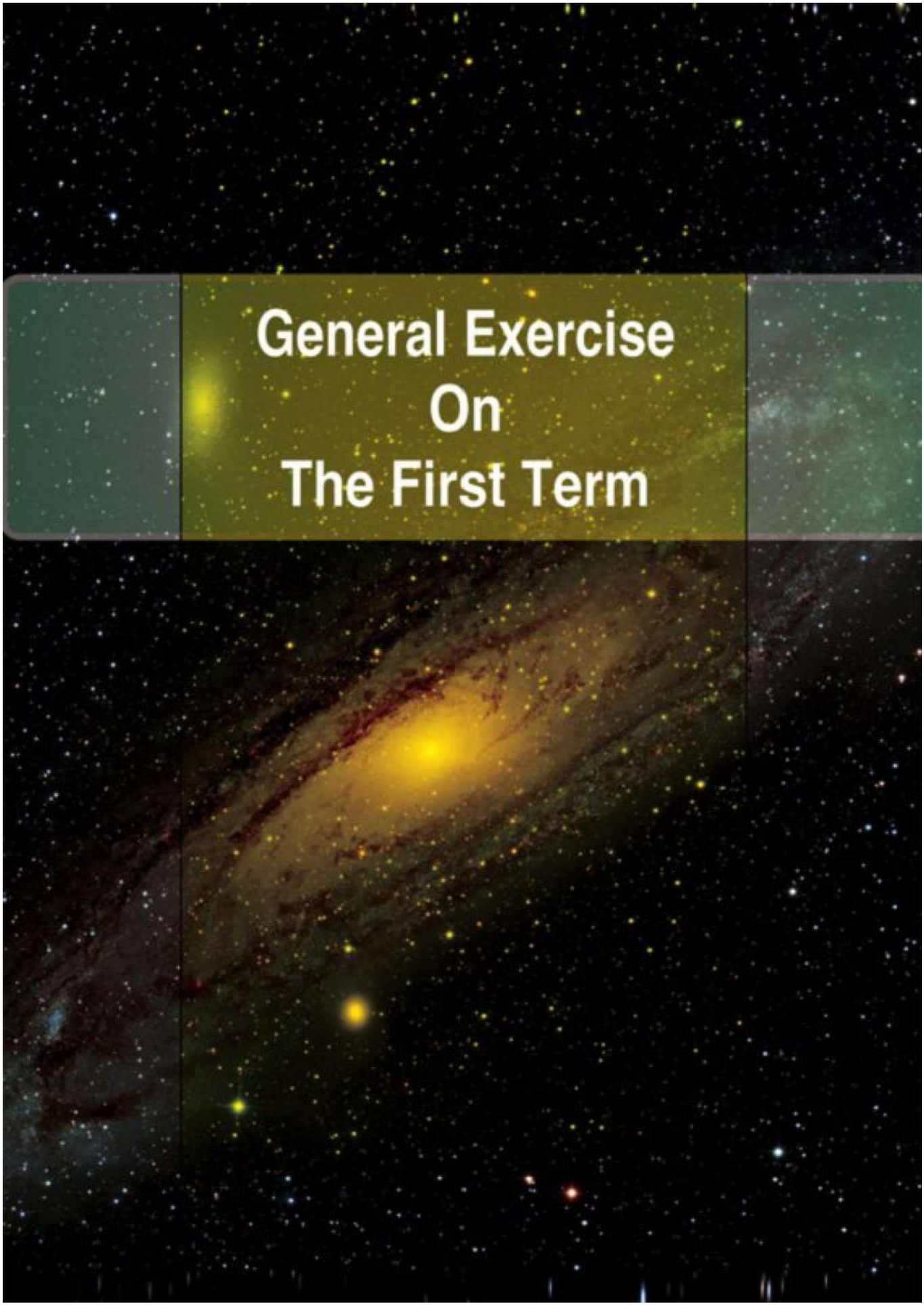
1- Day and night.

2- Solar system.

Question (7): Do you follow the weather forecast? why?

Question (8): Complete the following table:

Point of comparison	Oxygen	Carbon dioxide
Its ratio in the atmosphere		
Its importance		


General Exercise
On
The First Term

General exercise on the first term
Exercise (1)

Question (1): Complete the following:

1- The space occupied by a cube with one meter side equals .....

2- The moon completes its revolution around the earth in about ..... day while the earth completes its revolution around the sun in about ..... day.

3- The phenomena of ..... sequence results from the rotation of the earth around its axis, while the ..... sequence results from the revolution of the earth around the sun.

4- Silver is a shinny element, it belongs to the ..... group while sulpher is an element having no luster so it belongs to ..... group.

5- The atmospheric pressure is measured by ..... but the speed of the wind is measured by .....

6- Melting ice of the two poles is .... change.

7- The nearest planet to the sun is ..... while ..... is the farthest planet to the sun.

8- Decreasing the temperature of a liquid change it from ..... state to .... state

Question (2): Choose the correct answer:

1- The biggest planet in the solar system is .....
(A) The earth (B) Mercury (C) Jupiter (D) Mars

2- An example of non metals is .....
(A) Iron (B) Carbon (C) Copper (D) Aluminium

3- The temperature of the atmosphere is measured by .....
(A) anemometer (B) thermometer
(C) vane (D) Barometer

4- The number of the planets in the solar system is.....

(A) 4 (B) 6

(C) 8 (D) 9

5- Changing of the matter from a gaseous state to a liquid one is.....

(A) solidification (B) condensation

(C) evaporation (D) melting

6- The cooking pots are made up of .....

(A) graphite (B) aluminium

(C) Sulpher (D) Wood.

Question (3): Write the scentific term:

1- Everything occupies a space and has a mass.

2- Shinning objects radiate light and heat and appears in the sky at night.

3- A layer of iron oxide forms on a piece of iron.

4- Dark objects revolve around the sun and we live on it.

5- Coldness of the water vapour of the clouds and falls as rains.

6- Dark object reflects the fallen sun rays on its surface

Question (4): Give the scientific reasons:

1- The moon is a dark object, but we see it shinny in the dark.

2- The shape of a piece of copper has definite shape when we carry it from a vessel to another one.

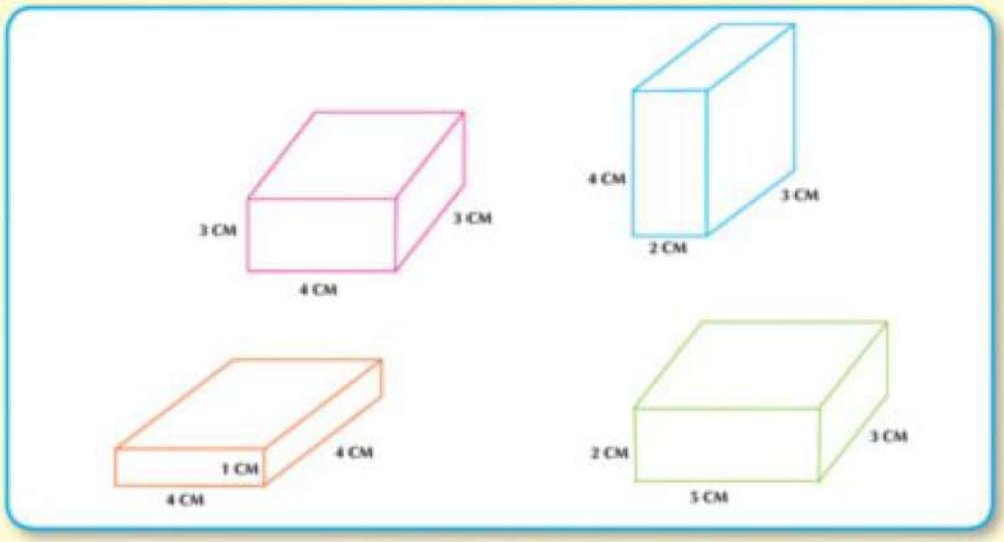
3- The occurrence of tides and ebbs .

Question (5): Match:

(A)	(B)
1- Mercury	(A) is called the red planet.
2- The earth	(B) the biggest planet.
3- Jupiter	(C) the farthest planet from the sun.
4- Neptune	(D) There are around colored rings rotate around it.
5- Mars	(E) first planet to the sun.
	(F) third planet to the sun.

Question (6) :

(A) The following objects are made up of iron which of them has the least mass and the least volume



Question (7): Give reasons:

1- Day and night sequence .

2- The sequence of the four seasons of the year .

3- Tide and ebb.

Question (8): you have unknown element, how can you know is it metal or non metal? using two different methods.

Exercise (2)

Question (1):Give reasons for each of the following :

1. Iron, copper and aluminium are good conductors of heat.

2. We see the moon shining in the middle of the lunar month.

3. The day in summer season is longer than the day in winter.

4. Occurrence of the tide and ebb.

5. If you get out a bottle full of water from refrigerator and leave it in the air, water drops are formed on its outer surface.

6. The graphite (carbon) is used in manufacturing of poles of dry cells.

7. Iron is used in manufacturing of bridges.

8. Uranus planet is named cold planet.

9. When you turn a little cup fill with water up side down and cover with white paper, water does not fall.

Question (2):Choose the correct answer :

1- The measuring unit of volumes of solid objects is measuring by .....

a- m b- cm^3 c- mm d- all the previous.

2- Changing the matter from liquid state to solid state accompanied with .....

a- an increase of heat. b- a decreasing in heat.

c- stability (constancy) of heat. d- an increase in mass.

3- From examples of physical change .....

a- burning of sugar. b- burning of coal.

c- melting of ice. d- burning of wax.

4- The sequence of the four seasons of the year is occurred due to ...

a- rotation the earth around its axis.

b- rotation the earth around the sun.

c- rotation the moon around the earth.

d- rotation the sun around its axis.

5- The ebb is arrived to its maximum when the moon is .....

a- first quadrature . b- second quadrature.

c- crescent. d- full moon.

6- Barometer apparatus is used in measuring of .....

a- wind speed. b- wind direction.

c- atmospheric pressure. d- temperature.

7- Nitrogen gas is used in manufacturing of .....

a- ammonia. b- papers.

c- wood. d- soft drink.

Question (3): Correct the following sentences:

1- Graduated ruler is used to determine the volume of irregular small stone.

2- The mass of equal volumes of different materials is equal.

3- Condensation is the change of matter from the liquid state to the solid state.

4- Metals are the simplest form that the matter found on it.

5- Adding table salt to water and stir it, the table salt disappears and a new substance is formed.

6- The sun is a planet and it emits light.

7- Tide and ebb phenomena benefit in getting petroleum.

Exercise (3)

Question (1):Complete the following sentences:

1- Kilogram = …….. gram.

2- 1 Litre = …….. milliliter.

3- The length can measure by some units as ……..…… or ……..……

4- The transfer of matter from liquid state to gaseous state is called .....

5- Some element has metallic luster as ……

6- Dissolving sugar in water is a ……..change, while iron rust is a …….. change .

7- Copper and graphite are good conductors of ……..……

8- Rotation of the moon around the earth leads to occurrence of ..... of the moon during lunar month.

9- Planets are …….. bodies that revolve around the sun in fixed orbits.

10- The return back of water to its normal level after the tide is called ……

11- The earth's axis is inclined causing the difference between ……

12- The solar system consists of eight ……..

13- Oxygen gas represents about …….. of the volume of the air.

14- In the …….. season, the day is shorter than the night.

15- The gas which makes limewater turbid is ……...

16- Air pressure is measured by ……apparatus.

Question (2):Choose the correct answer from those between brackets:

1- Volume of cuboids = ……

(length – width – height / length x width x height / length + width + height)

2- If your dimensions of your book are 5 , 2 and 2 cm, so the volume of the book equals …….. cm^3. (20 – 15 – 10)

3- The volume of an irregular shaped object is estimated by using a...

(graduated cylinder containing water –measuring ruler – common balance)

4- Electric wires are made up of ……

(sulphur – carbon – copper)

5- Water vapour is an example for …….. state.

(gaseous – liquid – solid)

6- From non-metal that found in liquid state at room temperature is...
(carbon – phosphorus – Bromine)

7- On decreasing the temperature of water vapour, it .....
(melts – freezes – condenses)

8- The central body of the solar system is the .....
(earth – sun – moon)

9- The most beautiful planet in shape in the solar system is .....
(Earth – Saturn – Venus)

10- In the middle of the lunar month, the moon's phase is .....
(crescent – new moon – full moon)

11- The phases of the moon are resulted from rotation of the .....
(earth around its axis – moon around the earth – earth around the sun)

12- The direction of the wind is measured by .....
(anemometer – wind vane – barometer)

Question (3):Write the scientific term:

1- Anything occupies a space and has a mass. (.....)

2- A unit used to measure the small masses. (.....)

3- The change that occur in the appearance of the matter without a change in its structure. (.....)

4- A change of matter from gaseous state to liquid state by cooling. (.....)

5- A change of matter from liquid state to solid state by cooling. (.....)

6- Elements that have lustre and have the ability to conduct electricity. (.....)

7- Dark object reflects the sun rays that fall on its surface. (.....)

8- A planet called the red planet. (.....)

9- One of the solar system planets and there are a coloured rings around it. (.....)

10- A gas used in the industry of ammonia. (.....)

Question (4):Put (√) in front of the right sentence and (×) in front of the wrong sentence:

1- Sensitive balance is used to measure the mass of jewels. ( )
2- Chemical change is a change in the form of the substance only. ( )
3- Carbon and sulphur have not luster. ( )
4- On rising up the temperature of a piece of wax it melt . ( )
5- Freezing is a change of solid matter to liquid state. ( )
6- Lime water is used to test for the presence of carbon dioxide gas. ( )
7- On decreasing the temperature of the water vapour, it condensing. ( )
8- Liquid matters have definite shapes and volumes. ( )
9- The moon is a shinning star radiates light and heat. ( )
10- The day in summer season is longer than the night. ( )
11- Hammering of iron is a chemical change. ( )
12- The largest planet in the solar system is Uranus planet. ( )

Question (5): Choose from column (B) what suits in column (A) then write the letter of choice under the table:

(A)	(B)
1- Air pressure	a- is measured by thermometer.
2- The maximum temperature	b- is measured by barometer.
	c- is measured by anemometer.
3- Wind direction	d- is measured by wind vane.
4- Wind speed	e- is the expected temperature during the night time.

(1 - .....) (2 - .....) (3 - .....) (4 - .....)

Question (6) :Correct the underlined words in the following statements:

1- The graduated ruler is used to measure the <u>mass</u>.
(.....)
2- The <u>graduated tape</u> is used to measure the mass of fruits and vegetables. (.....)
3- All metals are solid elements in normal temperature except <u>Bromine</u>, it is liquid element. (.....)

4- Solids are changing their shapes and volumes according to the container. (.....)

5- Sulphur is non-metal element and good conductor to electricity. (.....)

6- Oxygen gas enters in manufacturing of soft drink. (.....)

7- In winter and summer seasons, the day hours are equal to the night hours. (.....)

8- The ebb is the rising of the water level to cover parts of the seashores. (.....)

9- Barometer is used to measure wind speed. (.....)

10- Anemometer is used to measure temperature. (.....)

Question (7):Cross the odd word:

1- Aluminium – Mercury – Iron – Sulphur.

2- Bromine – Iron – Phosphorus – Sulphur.

3- Aluminium – Mercury – Iron – Copper.

4- Carbon – Bromine – Phosphorus – Sulphur.

5- Wind – Air pressure – Green plants – Temperature.

6- New moon – Square – Full moon – First quadrant.

7- Earth – Jupiter – Moon – Uranus.

Question (8):What is meant by:

Melting – Mass – Physical change – Chemical change – Metal

Question (9):Compare between :

1- Physical change and chemical change.

2- Metal and non – metal.

3- Sun and Mars.

4- Earth and moon.

5- The ebb phenomenon and tide phenomenon.

6- The sequence of the night and day phenomenon and the sequence of the season phenomenon.

7- The maximum temperature and the minimum temperature.

8- The anemometer and the barometer.

Question (10):What happens when.....?

1- Rising of the temperature of a piece of ice .

2- You expose a shiny nail made of iron to wet air for a certain period.

3- Putting a glass full of water in the freezer for 24 hours .

4- Boiling of water and exposing the product to a cold surface .

Question (11):Give reason for each of the following :

1- The poles of the dry cell are made of Graphite.

2- Using copper in manufacturing of electric wires .

3- The sun seems bigger to us than the other stars.

4- The earth is a planet

5- The sequence of the day and night .

6- The sequence of the four seasons.

7- The clear limewater become turbid when blowing in it .

8- Carbon dioxide is used in fires extinguish.

Question (12):Answer the following questions:

1- What is the importance of the oxygen gas?

2- What is the importance of the nitrogen gas?

3- What is the importance of the carbon dioxide gas?

4- What are the benefits of the ebb and tide?

5- What is the importance of the weather prediction?

6- Complete the following table :

Sugar dissolving in water – wood burning – iron rusting – wax melting

Physical change	Chemical change

7- Arrange the following planets according to the nearest from the sun. (The nearest first)

Neptune – Venus – Uranus – Mars – Earth – Saturn

المواصفات الفنيـــة:

مقـاس الكتـــاب:	$\frac{1}{16}$ (٧٠ × ١٠٠) سم
طبـــع الـمتـــن:	٤ ألوان
طبـــع الغـــلاف:	٤ ألوان
ورق الـمتـــــن:	٨٠ جم أبيض
ورق الغـــــلاف:	٢٠٠ جم كوشيه
عدد الصفحات بالغلاف:	١٢٤ صفحة

الأشـــراف برنتنج هاوس